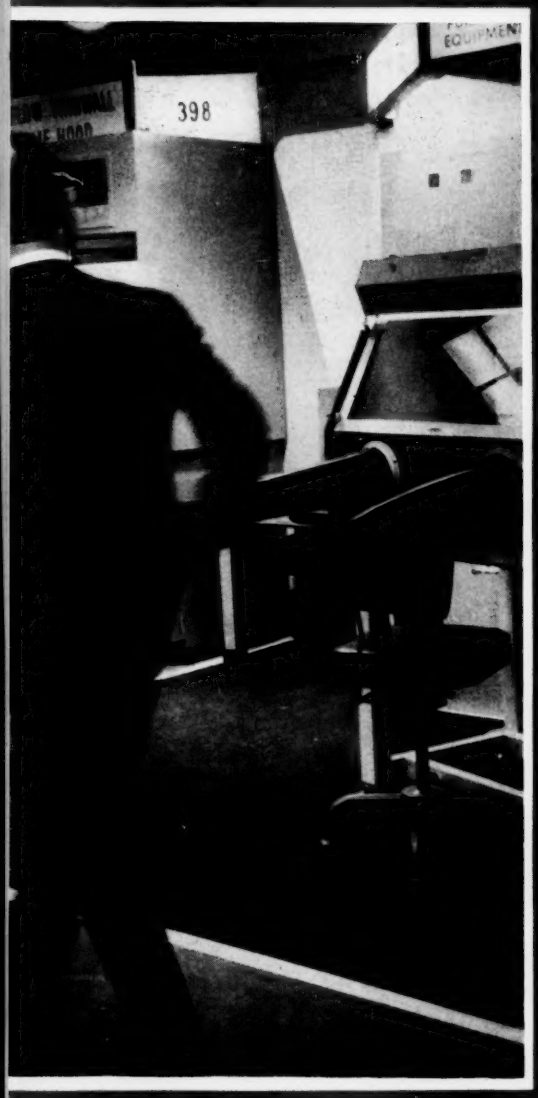
Chemical Week

December 14, 19[illegible]

Price 25 cents



[illegible] vie for attention
[illegible] Chemshow . p. 37

[illegible] leads—cosmetic
[illegible] keep the quest
. . . . . p. 47

[illegible] coal chemicals: BTX
[illegible] new competi-
[illegible] aromatics . p. 84

[illegible] reinforced plastics
[illegible] above '56. Makers
[illegible] cost . . . p. 85

483
[illegible] CALS
OR INDUSTRY

E P POWER
UNIVERSITY MICROFILMS I
313 N 1ST ST
ANN ARBOR MICH

A [illegible] M c G R A W - H I L L P U [illegible]

Helping you handle chemicals with greater safety

The great safety record of the Chemical Industry is inspiring proof that chemical users, as well, can institute and carry out effective safety programs.

As a helpful contribution to this effort, Olin Mathieson has prepared a series of safety wall charts on . . .

CHLORINE • LIQUID CAUSTIC • SULFURIC ACID
ANHYDROUS AMMONIA • NITRIC ACID

These wall charts will keep your employees constantly posted on correct handling procedures, on basic precautions to be observed, and on first aid methods when emergencies *do* occur.

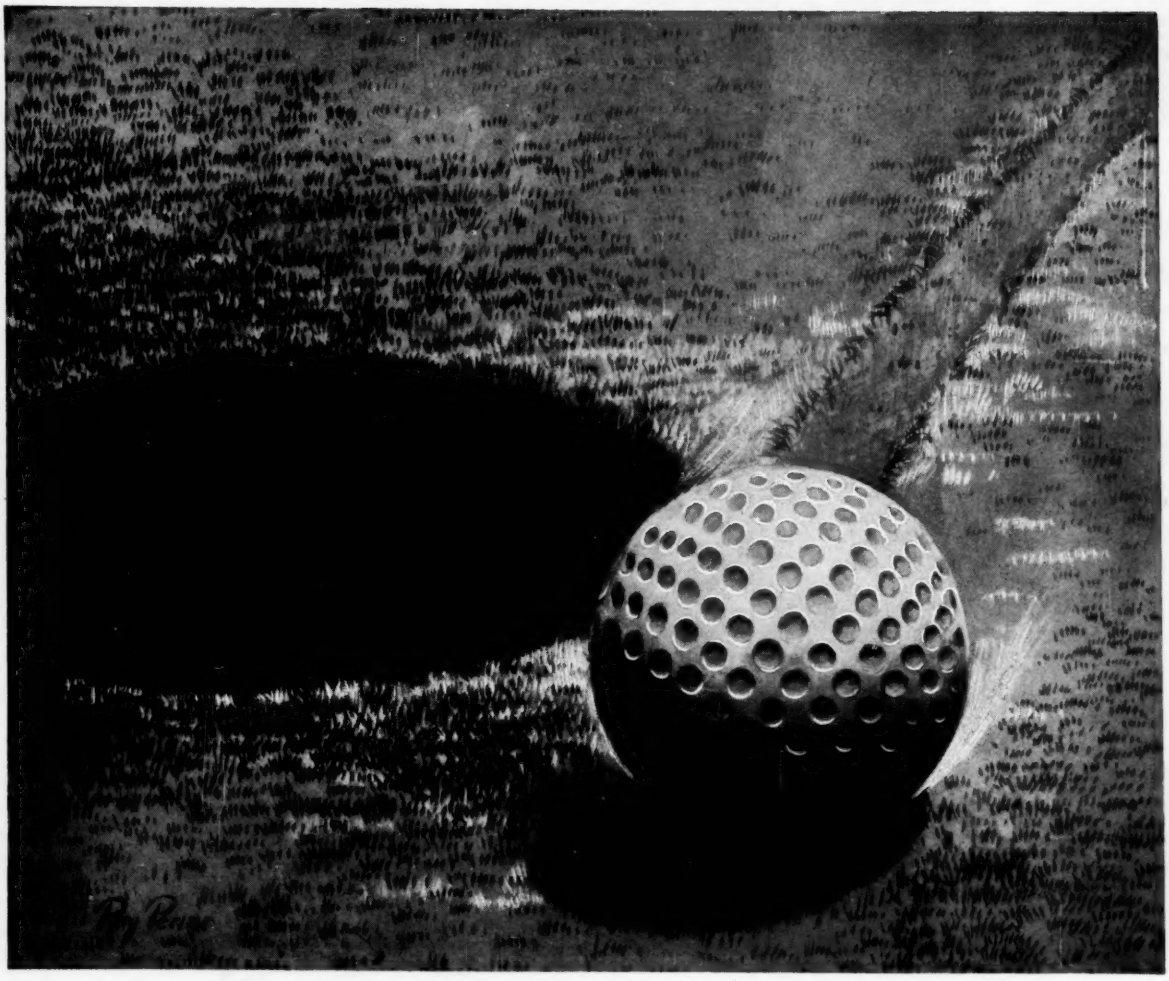
We will gladly send you the safety charts you need without obligation.

MATHIESON CHEMICALS
OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION · BALTIMORE 3, MD.

5305

MATHIESON

Ammonia · Bicarbonate of Soda · Carbon Dioxide · Caustic Potash · Caustic Soda · Chlorine · Ethylene Diamine · Formaldehyde
Hexamine · Hydrazine and Derivatives · Hypochlorite Products · Methanol · Muriatic Acid · Nitrate of Soda · Nitric Acid
Polyamines · Soda Ash · Sodium Chlorite Products · Sodium Methylate · Sulfate of Alumina · Sulfur (Processed) · Sulfuric Acid



All it takes is practice!

When that ball skims the edge of the cup, you can blame wind, weather, putter, green, your wife's cooking, or a fleeting conflict of ego and libido. But when the shot is sunk, you can credit experience, practice and knowledge of the course. It's the same with titanium.

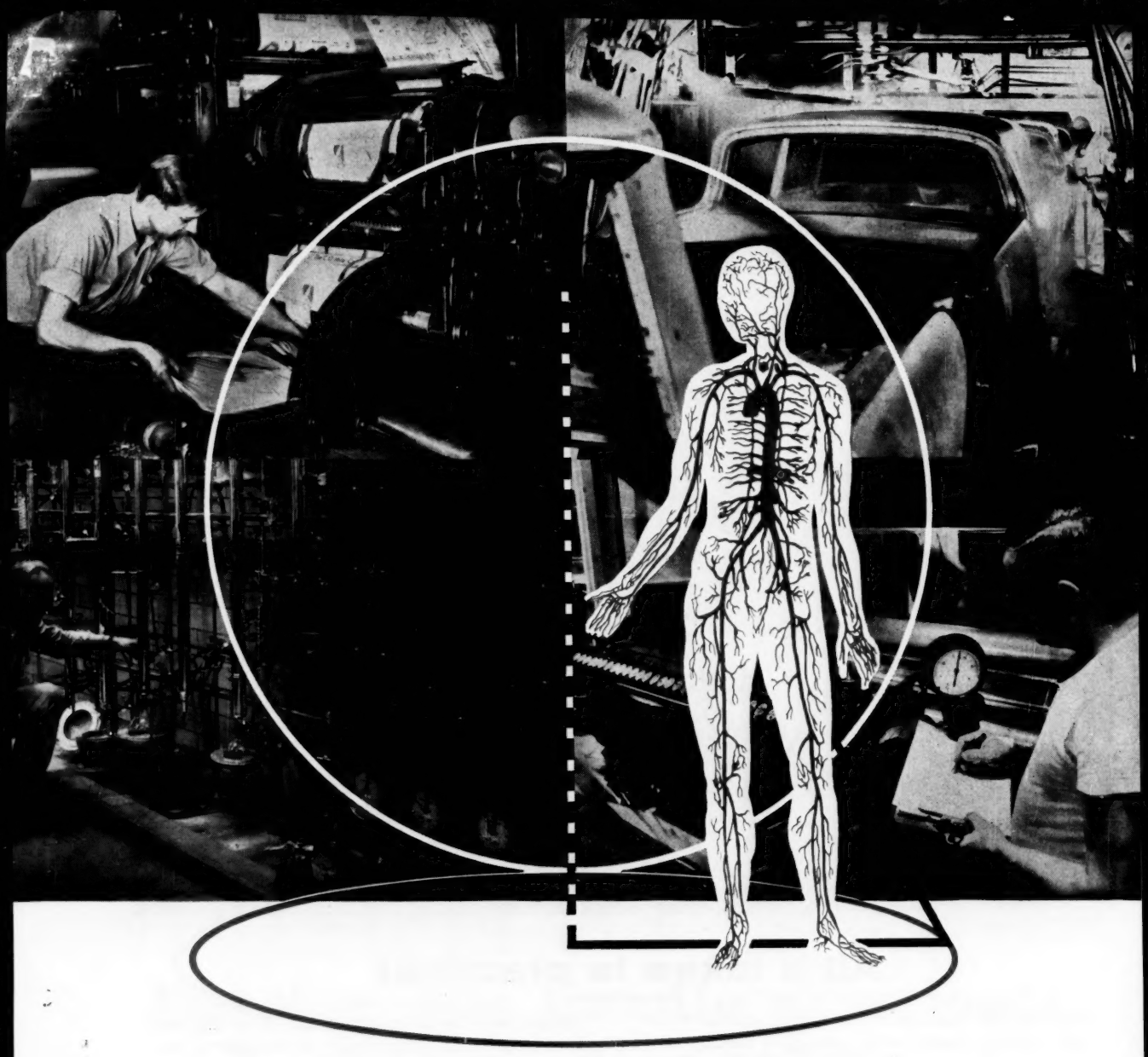
Titanium can be readily forged, machined, welded, stretched and drawn into shapes having high strength, light weight and superlative resistance to both heat and corrosion. Titanium fabricating, joining and finishing practices are no more difficult than for many other engineering metals, but they are different.

TMCA has accumulated a great deal of pertinent experience and practical data which are available to you on request. Extensive research facilities can also expedite special investigations to answer your specific questions.

TMCA has a selfish reason for helping you "sink the shot" whenever a technical challenge arises. Our Technical Service Department is anxious to discuss your application and cooperate in the establishment of routine fabricating and joining techniques for this outstanding engineering metal . . . now priced competitively.

. . . FIRST IN Titanium

TITANIUM METALS CORPORATION OF AMERICA, 233 Broadway, New York 7, N.Y.



SOLVENTS . . . industry's life-giving fluids

When organic coatings and printing inks have places to go, like on automobile bodies and printing presses, it's the job of their oxygenated solvents to take them there and apply their films. Then, these remarkable vehicles evaporate at the precise rate required for the particular end use.

Celanese, a leading supplier of these industrial solvents, is conducting a continuing study into the problems of industry so that solvents of even greater usefulness and economy can be developed. This program has already produced an important family of specialized solvents for the paint and coatings industry. Manufacturers can now replace costlier fluids with lower cost solvents that offer greater dissolving power, better flow, superior blush resistance, improved all-around performance. Special attention is even paid to the correct flash point.

Researching into the problems of industry . . . applying the findings to practical solutions to improve manufacturing efficiency . . . this is another example of Celanese research and product development teams working hand-in-hand to supply industry with basic and intermediate materials that meet specific requirements. Celanese Corporation of America, Dept. 752-L, Chemical Division, 180 Madison Ave., N. Y. 16. Celanese®

Export Sales: Amcel Co., Inc., and Pan Amcel Co., Inc., 180 Madison Avenue, New York 16

Basic reasons . . . . . .

Acids	Functional Fluids	Polyols
Alcohols	Gasoline Additives	Plasticizers
Aldehydes	Glycols	Salts
Anhydrides	Ketones	Solvents
Esters	Oxides	Vinyl Monomers

Celanese
CHEMICALS

. . . . . for improved products

Agricultural	Paper
Automotive	Pharmaceutical
Aviation	Plastics
Building	Surface Coatings
Electrical	Textiles

Chemical Week

Vol. 81, No. 24 December 14, 1957

TOP OF THE WEEK

- **Thermionic device converts heat into electricity:** efficiency's low, but the potential for use is big ..... **p. 55**
- **Baltimore's new advertising tax draws fire** of local chemical process companies. Fear: other cities will follow suit .. **p. 69**
- **Catalin takes its directors on a plant tour,** shows off new research facilities ..... **p. 94**

27 OPINION

28 MEETINGS

33 BUSINESS NEWSLETTER

37 Chemshow pulls a record crowd—biggest-ever display of chemical products and equipment.

39 National Distillers swaps stock to secure Panhandle Eastern's 40% of National Petrochemicals.

39 Government capital-spending survey confirms a slackening of chemical expansion.

43 WASHINGTON NEWSLETTER

47 SPECIALTIES
Royal jelly is the hottest thing in cosmetic formulation, promotion. Here's the full story.

55 RESEARCH
Direct heat-to-electricity converter developed by General Electric.

58 More labs join the search for cancer-killing chemicals; U.S. has earmarked $11 million for the job.

64 ENGINEERING
Two steel makers are swinging over to a "petrochemical approach" in coal-chemicals production.

69 SALES
Baltimore's new tax on local advertising stirs wrath of chemical makers.

75 PRODUCTION
U.S. Steel relies on electrostatic precipitators to clean mill exhaust, stifle claims of fluorine damage.

81 TECHNOLOGY NEWSLETTER

85 MARKETS
Sales of reinforced plastics will climb an estimated 20% in 1957—producers were expecting a 30% hike.

91 MARKET NEWSLETTER

94 ADMINISTRATION
Catalin combines a plant tour for directors, with first look at future plans.

100 CW REPORT
Here's the rundown on 483 new chemicals introduced this year.

Watch CW Grow — 39,397 copies of this issue printed

Chemical Week (including Chemical Specialties and Chemical Industries) is published weekly by McGraw-Hill Publishing Co., Inc., James H. McGraw (1860-1948), founder. **Executive, Editorial, Circulation and Advertising offices:** McGraw-Hill Building, 330 West 42nd St., New York 36, N. Y. Publication office: 1309 Noble St., Philadelphia 23, Pa. See instructions at right regarding subscriptions or change of address. Donald C. McGraw, President; Joseph A. Gerardi, Executive Vice-President; L. Keith Goodrich, Vice-President and Treasurer; John J. Cooke, Secretary; Nelson Bond, Executive Vice-President, Publications Division; Ralph B. Smith, Vice-President and Editorial Director; Joseph H. Allen, Vice-President and Director of Advertising Sales; A. R. Venesian, Vice-President and Circulation Coordinator.

Subscriptions to Chemical Week are solicited from management men in the chemical process industries. **Position and company connection must be indicated on subscription order.** Send to address shown at right. United States and United States Possessions subscription rate for individuals in the field of the publication, $3 per year; single copies 35¢. Foreign subscription rates per year: Canada $4; other Western Hemisphere countries, $15; all others, $25, payable in advance. Second-class mail privileges authorized at Philadelphia, Pa. Printed in U.S.A. Title registered in U.S. Patent Office. © Copyright 1957 by McGraw-Hill Publishing Co., Inc. All rights reserved.

Send subscription correspondence and change of address to Subscription Manager, Chemical Week, 330 West 42nd St., New York 36, N. Y. Subscribers should notify Subscription Manager promptly of any change of address, giving old as well as new address, and including postal zone number, if any. If possible, enclose an address label from recent issue of Chemical Week. Please allow one month for change to become effective.

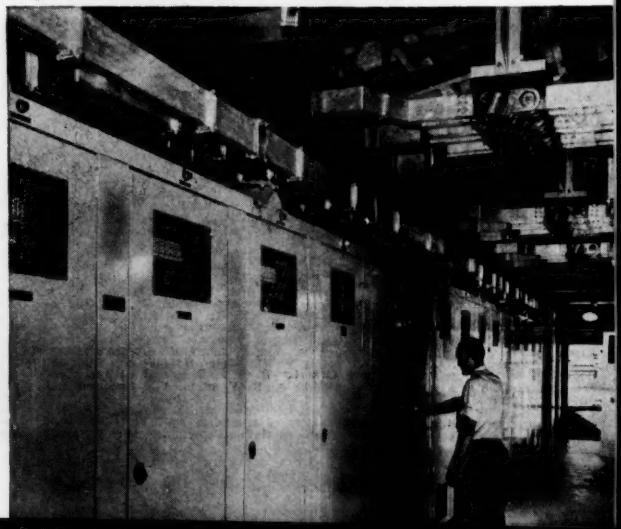
Postmaster: Please send Form 3579 to Chemical Week, 330 West 42nd St., New York 36, N. Y.

ENGINEERING REPORTS:

COMPACT LINEUP of germanium rectifiers total 30,000 amps, at 150 volts. Each contains three rectifier and one coolant system compartments. Regulating autotransformer and induction regulator (outside) reduce incoming power at 22 kv to 13.8 kv.

OVERHEAD METAL enclosed busway connects four rectifier transformers with rectifier compartments inside. Busway is factory-designed for high system efficiency and easy installation.

OUTPUT CURRENT is measured by d-c current transformers. Signals from d-c c-t's are fed into regulating equipment to provide automatic control of load current.



AT DOW CHEMICAL'S PITTSBURG, CALIFORNIA, PLANT . . .

NEW General Electric d-c power system improves process efficiency

G-E germanium rectifier system increases power available for chlorine-caustic electrolytic cell operation.

The Dow Chemical Company's Western Division Plant at Pittsburg, California, has improved efficiency and power available for its chlorine-caustic electrolytic cell operation. Utilization of new General Electric germanium rectifying equipment integrally designed into a co-ordinated electrical system allows automatic control of the operation's electric supply and has resulted in reduced operating costs.

Prior to the new installation of equipment, the electrolytic cell lines of similar ratings—30,000 amps at 150 volts d-c—were powered by motor-generators. Now the new system is able to provide high d-c current with an efficiency of over 95 per cent even at a low voltage. Germanium's low power loss also means that equipment necessary for cooling is kept to a minimum. Being a static device, the germanium rectifier system at the Dow plant offers the additional advantage of low maintenance. This equipment is ideally suited to such applications due to inherent high efficiency of the germanium rectifier.

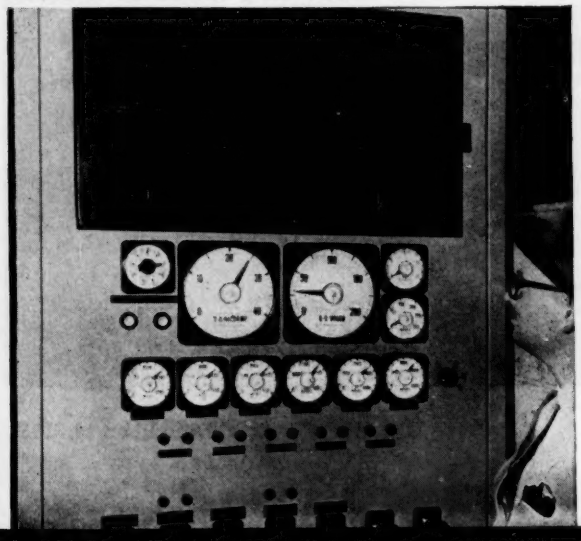
Semiconductor rectifiers of the germanium type used at Dow, or silicon type, provide efficient, highly reliable, and flexible systems for electrochemical applications.

Co-ordination of the equipment into a flexible electrical system—designed to meet this plant's special needs—resulted from close co-operation between Dow Chemical and General Electric engineers. To meet your specific power system needs, General Electric engineering services can help design, equip and install a co-ordinated electrical system from one-line diagram to on-time start-up. Early in your planning (feasibility stage), call your General Electric Apparatus Sales Office. Meanwhile, write for bulletins GEA-6375A on semiconductor power rectifiers, and GEA-6684 on semiconductor rectifier power conversion systems, to the General Electric Company, Section 662-50, Schenectady 5, N. Y.

Engineered Electrical Systems for the Chemical Industry

GENERAL ELECTRIC

EYE LEVEL operator's panel for rectifiers provides manual and automatic control, individual and total rectifier load indication, alarm and annunciator functions.



RECTIFIER SYSTEM overcurrent problems are eliminated by providing protective relays in each rectifier direct-current output circuit.

the art of construction is not built on theory

Building is a practical art. Its application takes brains, experience, vision and a disciplined devotion to the most exacting detail of the specifications and the time schedule. We've built an organization here at Procon that practices this art in this realistic way.

This Procon service is offered to the oil refining, chemical and petrochemical industries, anywhere in the world. New plant construction, expansion or modernization, whatever the requirement, Procon will do it right, and on time.

PROCON *Incorporated*

1111 MT. PROSPECT ROAD. DES PLAINES. ILLINOIS. U. S. A.

PROCON (CANADA) LIMITED. TORONTO 18. ONTARIO. CANADA
PROCON (GREAT BRITAIN) LIMITED. LONDON. W. C. 2. ENGLAND
PROCON INTERNATIONAL S. A.. SANTIAGO DE CUBA

WORLD-WIDE CONSTRUCTION FOR THE PETROLEUM, PETROCHEMICAL, AND CHEMICAL INDUSTRIES

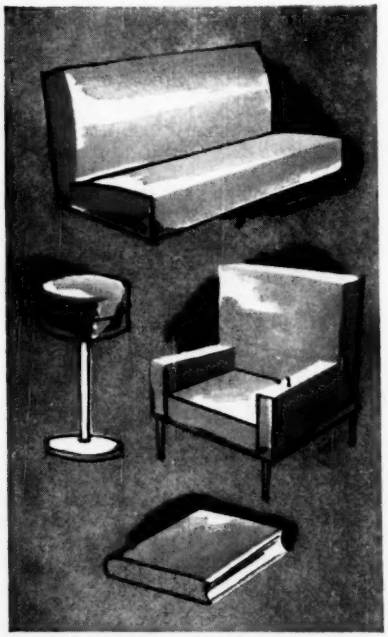
PROCON ®

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

PRODUCT NEWSLETTER

featuring **THF** *tetrahydrofuran*



Pastel-colored vinyl upholstery retains its new appearance longer with top coatings made with THF.

THF-applied top coatings give pastel-colored upholstery rich luster and high soil resistance

Today's color revolution is producing smartly turned-out auto interiors and home furnishings in decorator pastel colors. As a result, specifications for soil and stain resistance in the supported fabrics and vinyl sheeting used in these applications are being given even greater emphasis.

Modern tastes also dictate that these materials must have the luster of leather . . . plus high resistance to tearing, abrasion, flexing, moisture, chemical and sunlight attack.

Manufacturers of automobile and upholstery fabrics have found that top coatings made from high molecular weight polyvinyl chloride resins fill all these requirements. That's where the powerful solvent action of Du Pont tetrahydrofuran comes in. At room temperatures this colorless liquid dissolves these resins, which are practically insoluble in other low-boiling solvents. Tetrahydrofuran's high solvent power and rapid solvent action assure good adherence of top coats and permit operation at increased machine speeds.

3-way protection against soiling. THF-applied top coatings of high molecular weight PVC resins resist soiling three important ways: They provide a tough film, resistant to abrasion and scratches, thus minimizing the tendency of the surface to retain dirt and stains. They provide a "barrier effect" to plasticizer migration, which otherwise can impart a tacky feel to the plastic and increase soil susceptibility. They can incorporate a wide range of dulling agents and resins to modify hand and luster with minimum loss of soil-resistant properties.

Efficient recovery methods cut costs. Efficient recovery of THF from solvent applications greatly reduces the cost of this superior solvent. To help you, Du Pont is prepared to assist in the design of both carbon adsorption and water-scrubbing recovery systems.

Availability. Tetrahydrofuran is available in drum, carload-drum, and tank-car quantities. Working samples also are available to manufacturers interested in investigating THF-applied top coatings. Du Pont's technical force will be glad to work with you in developing your particular application of THF. For the complete THF story, write to:

E. I. du Pont de Nemours & Co. (Inc.)
Electrochemicals Department
Chlorine Products Division CW-12
Wilmington 98, Delaware

PHYSICAL PROPERTIES of THF

Appearance	Colorless, mobile liquid
Odor	Etherlike
Molecular weight	72.10
Freezing point	−108.52°C.
Boiling range	65°-67°C.
Flash point (Tag closed cup)	6°F.
Vapor pressure, mm Hg. at:	
25°C.	176
45°C.	385
66°C.	760
Solubility	miscible with water, soluble in most organic solvents.

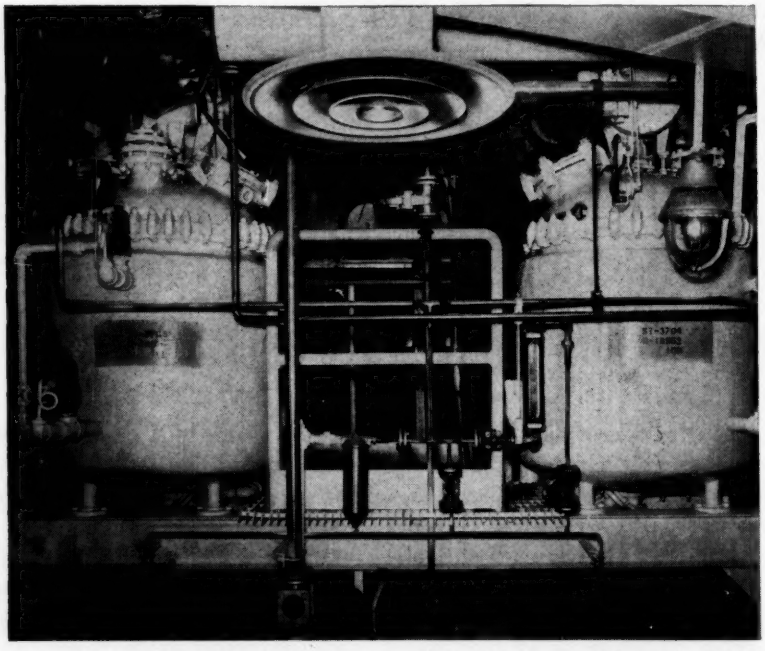
OTHER USES for THF

Versatile THF is also used as solvent in PVC adhesive formulations, in casting of PVC film, and in applying coatings of PVC and "Saran" resins to films and fabrics. It is finding increased use as a reaction solvent. For specific information on any of these uses write to the address on the right.

Cut drying time up to 90%. For information on Pfaudler glassed steel dryer-blender, ask for Data Sheet 26.

Pfaudler

Pfaudler Corrosioneering News Published by The Pfaudler Co., a division of Pfaudler Permutit Inc., Rochester, N.Y.



Isolating finished steroids is done in these two Pfaudler glassed steel reactors at Merck & Co.'s Cherokee plant. Absolute cleanliness and corrosion resistance are musts here as in all other parts of complex steroid production which involve several highly corrosive acids. See text.

New MERCK Plant a Classic Study in Corrosive Processing

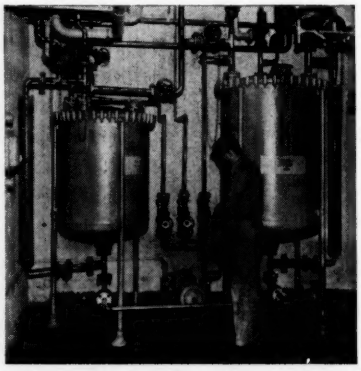
You're putting a new product into production. Serious corrosion problems are involved. You must justify the need for special equipment in terms of profit return on capital investment. Such were the problems met at the new Merck & Co. plant in Danville, Pa.

The plant makes steroids to pharmaceutical grade specifications. Bromine, hydrobromic acid, chlorine and hydrochloric acid, and a series of organic acids are just a few of the corrosive substances that enter into the complex reactions that produce the steroids.

What sort of equipment do you use to produce steroids that satisfy both the quality controllers and the company comptrollers who expect a fair return on their equipment investment?

Experience is the answer

Because of their long, long experience with corrosives, the men at Merck found that the problem spelled out its own answer: Pfaudler glassed steel equipment.



Bromine, Chlorine and their acids are among the biting corrosives handled by these Pfaudler intermediate series kettles at Merck plant. Merck engineers specified Pfaudler without hesitation, basing their confidence on long experience with Pfaudler glassed steel reactors and storage tanks.

Pfaudler glassed steel because this construction material withstands more corrosives than any other — including the halogens and acid halides mentioned above.

Pfaudler glassed steel because it cannot act as a catalyst itself nor will it release trace metals which might trigger treacherous side reactions.

Pfaudler glassed steel because of ease in cleaning and operational longevity—twenty to thirty years of corrosion-free service in many instances.

Pfaudler glassed steel, finally, because of successful experience—our own 73 years of experience and the experience of companies such as Merck to whom "corrosioneering" is a continuous and profitable study.

Four ways to avoid thermal shock damage to glassed steel

We'd be among the last to ask you to *baby* Pfaudler glassed steel, but we do know for fact that *a little tender care* will help your vessels last longer. Tender care such as this:

One. Keep your operating temperatures below 450°F. unless you consult with our engineering department. This limit can be exceeded but it calls for careful study.

Two. Watch your temperature differentials, especially when dumping a cold charge into a hot vessel.

On *standard* vessels up to 2000 gallons, we usually recommend these temperatures:

Reactor temp.	Charge temp. should be at least	Safe temperature differential
250°F.	50°F.	200°F.
300	125	175
350	200	150
400	270	130
450	335	115

When emptying a hot medium into the jacket of a cold reactor, the difference between jacket and reactor temperature should not exceed the "safe" temperature shown above.

Dumping a hot charge into a cold vessel is not as critical, but we recommend a maximum temperature differential of 200°F. throughout the temperature range at which you normally use the equipment.

The same 200°F. differential holds for injecting a cold medium into the jacket of a reactor. Agitating nozzles and their attached baffles help eliminate thermal shock in such cases by

Corrosioneering News

Quick facts about services and equipment available to help you reduce corrosion and processing costs.

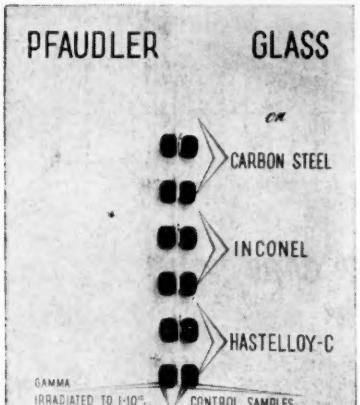
diffusing stream flow and reducing the instantaneous temperature differential.

Three. Be careful when welding or torch cutting. Do not weld to the tank proper under any circumstances. Use electric welding to the jacket, never acetylene. When welding to the jacket sealer, keep at least 2" away from the tank proper. When torch cutting the jacket, cut at an angle to keep flame away from wall of the vessel itself.

Four. Take note of the heat developing from exothermic reactions inside the vessel. Damage to the glass is unlikely unless the reaction gets completely out of hand. For safest operation, however, we recommend that the 200°F. differential be maintained.

Corrosion resistance of glassed steel unimpaired by gamma radiation

No adverse effects could be detected from the exposure of glassed steel to gamma radiation in tests recently completed by Pfaudler in cooperation with Oak Ridge National Laboratory and other installations.



Preliminary evaluations have been completed on the test which exposed glassed samples to a total dose of 10^{10} roentgen from spent fuel elements.

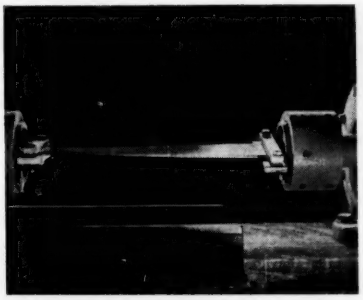
Glassed steel is being considered as a construction material for chemical processing involving nuclear energy wherever corrosive conditions are particularly severe and ease of decontamination is important.

Probable uses of glassed steel in this vast field include storage of acids and other materials which may or may not be radioactive, storage and

continued middle next column

How strong is glassed steel?

We twisted this piece of glassed steel a full 14°, stressing it beyond the elastic limit of the steel itself. Yet the glass-to-steel bond and the glass itself remained intact . . . 100% intact.



This test would satisfy little more than our innate curiosity except for the fact that structural strength *is*

continued top next column

disposal of radioactive wastes, and chemical processing of highly radioactive and corrosive materials.

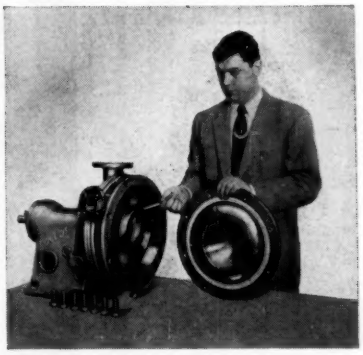
Both mechanical and corrosion tests indicate that Pfaudler glass is unaffected by gamma radiation up to 10^{10} r, although a color change does occur. Base metals used included carbon steel, Hastelloy C, and Inconel. The corrosion resistance of the glass did not change with the various base metals employed.

A larger test program is now under way to follow up these early results and to determine more conclusively the effect of radiation on glassed metals.

important in the vessels you buy from Pfaudler.

Why such strength? Three reasons —(1) When the glass and steel are fired at high temperature, the molten glass chemically *etches* the steel, resulting in a powerful chemical and mechanical bond. (2) The compressive forces within the cooled glass toughen the glass and provide a cushion for mechanical and thermal shocks. (3) The "bracing" of the glass by its steel backing.

Now...a glassed pump!



Take a Goulds centrifugal pump and glass its entire interior surfacing and you have a workhorse that assures years of corrosion-free operation at low cost.

The Goulds-Pfaudler pump offers high corrosion resistance to all the common acids except hydrofluoric and mild alkalies.

Write to Goulds Pumps, Inc., Seneca Falls, N. Y., for descriptive bulletin.

THE PFAUDLER CO., a division of PFAUDLER PERMUTIT INC.,
Dept. CW-127, Rochester 3, N.Y.

Please send me: ☐ Bulletin 955, Installation of glassed steel reactors; ☐ Bulletin 947, Buyer's Guide; ☐ Bulletin 892, Structural Strength of glassed steel.

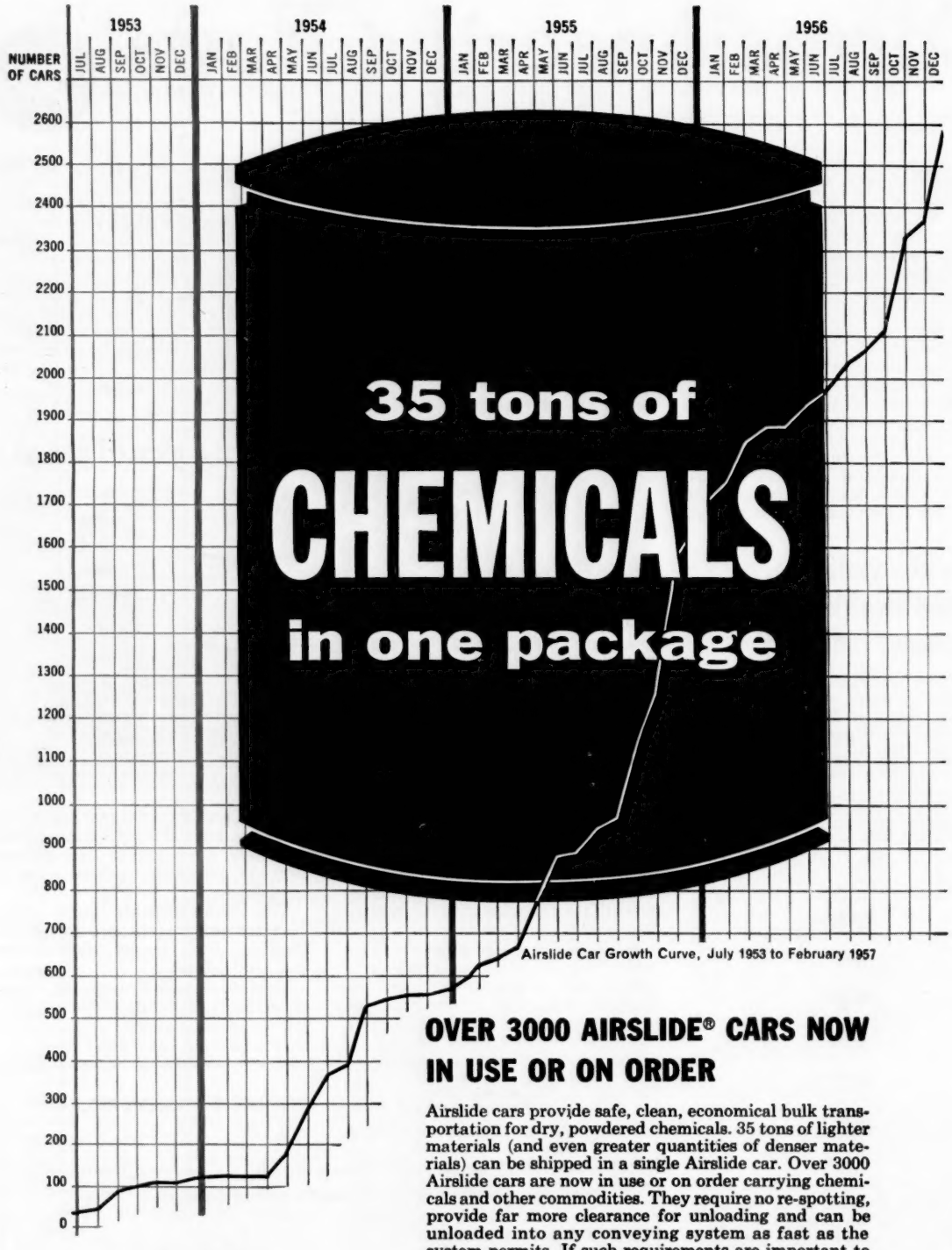
Name.....

Title.....

Company.....

Address.....

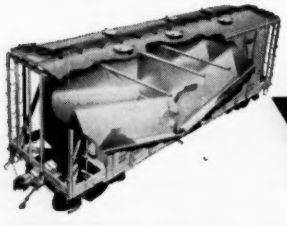
City..... Zone..... State.....



Airslide Car Growth Curve, July 1953 to February 1957

OVER 3000 AIRSLIDE® CARS NOW IN USE OR ON ORDER

Airslide cars provide safe, clean, economical bulk transportation for dry, powdered chemicals. 35 tons of lighter materials (and even greater quantities of denser materials) can be shipped in a single Airslide car. Over 3000 Airslide cars are now in use or on order carrying chemicals and other commodities. They require no re-spotting, provide far more clearance for unloading and can be unloaded into any conveying system as fast as the system permits. If such requirements are important to you, write today for full information about General American's new Airslide car.



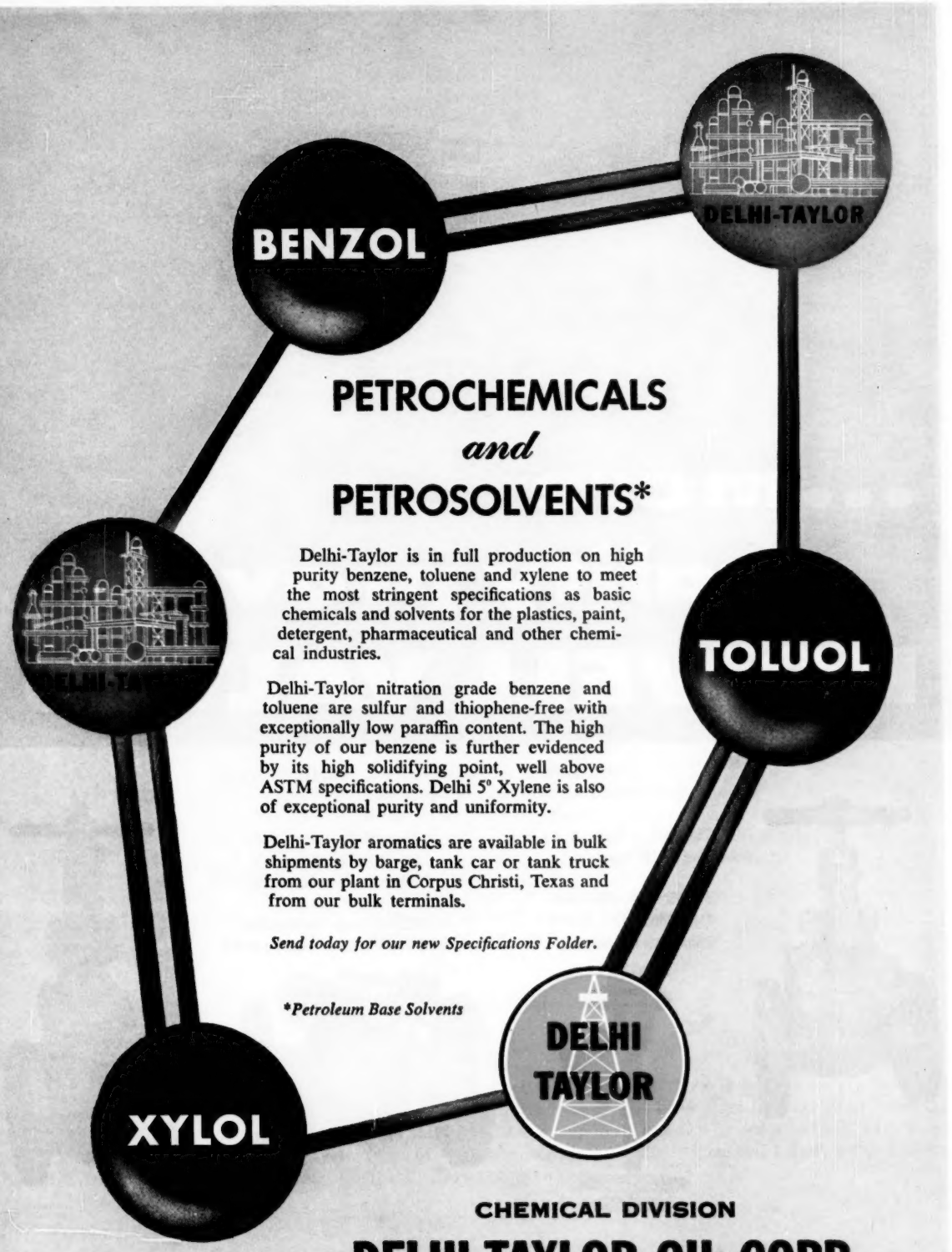
CLEAN INTERIOR DESIGN. *All-welded construction provides maximum sanitation and minimum product retention. All hatches and outlets provide a hermetic seal, assuring complete in-transit protection.*

AIRSLIDE GENERAL AMERICAN TRADE MARK

It Pays To Plan With General American

GENERAL AMERICAN TRANSPORTATION CORPORATION

135 South LaSalle Street • Chicago 90, Illinois • Service Offices In Principal Cities • Service Plants Throughout The Country



PETROCHEMICALS *and* PETROSOLVENTS*

Delhi-Taylor is in full production on high purity benzene, toluene and xylene to meet the most stringent specifications as basic chemicals and solvents for the plastics, paint, detergent, pharmaceutical and other chemical industries.

Delhi-Taylor nitration grade benzene and toluene are sulfur and thiophene-free with exceptionally low paraffin content. The high purity of our benzene is further evidenced by its high solidifying point, well above ASTM specifications. Delhi 5° Xylene is also of exceptional purity and uniformity.

Delhi-Taylor aromatics are available in bulk shipments by barge, tank car or tank truck from our plant in Corpus Christi, Texas and from our bulk terminals.

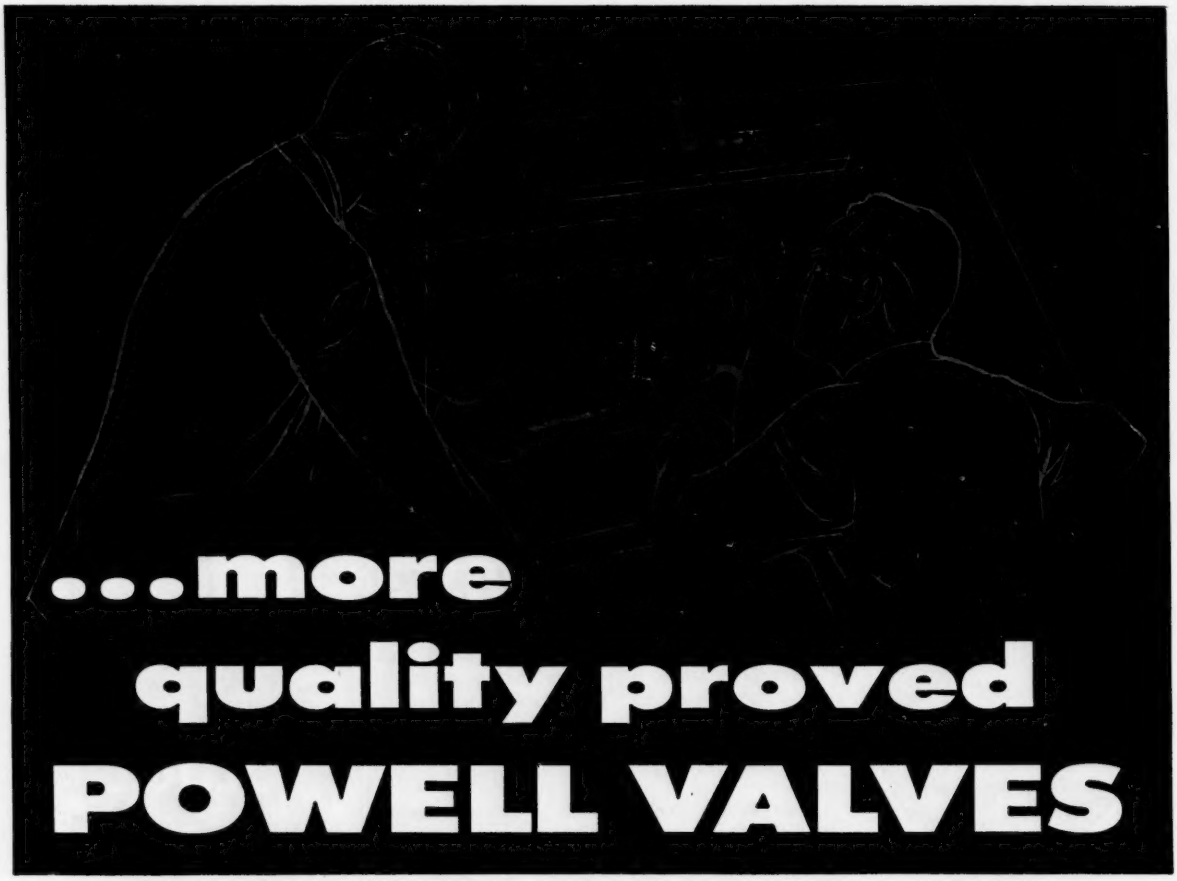
Send today for our new Specifications Folder.

**Petroleum Base Solvents*

CHEMICAL DIVISION

DELHI-TAYLOR OIL CORP.

415 Madison Ave. • New York 17, N.Y.



...more quality proved POWELL VALVES

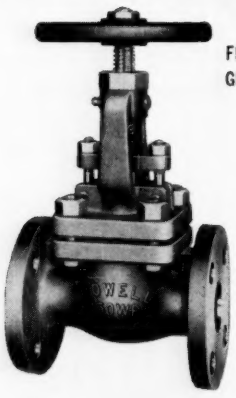
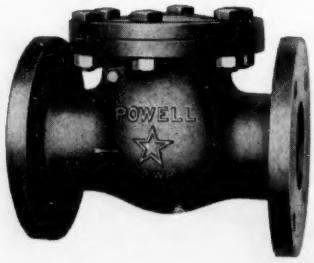


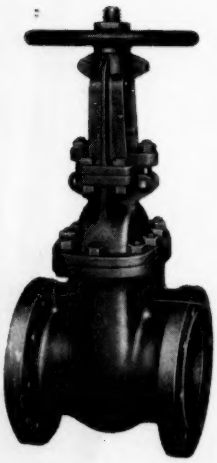
FIG. 2475—Stainless Steel O.S. & Y. Globe Valve for 150 Pounds W.P.

FIG. 2309 SW—150-Pound Flush Bottom Tank Valve with Powell Patented Seat Wiper.

FIG. 2456 SG—Large Stainless Steel Gate Valve for 150 Pounds W. P. Flanges conform to latest Standards.

FIG. 2433 SS—Large Stainless Steel Swing Check Valve for 150 Pounds W.P.





Designed for long life, designed for dependable service

Consult your Powell Valve distributor for all the facts about quality proved bronze, iron, steel and corrosion-resistant valves. No matter what the flow control problem, a Powell Valve can solve it . . . *better.*

THE WM. POWELL COMPANY, CINCINNATI 22, OHIO . . . 111th YEAR

EACH NOPCO CHEMICAL MAKES A **PROBLEM OBSOLETE**

NOPCO DEFOAMERS

for instance...

PAPER ...give uniform sheet formation, higher machine speeds, fewer "wet breaks".

PAINT ...prevent trapped air in latex paints, for uniformly filled cans and smooth, bubble-free painting.

DAIRY INDUSTRY ...effect faster, more trouble-free production of skim milk for poultry and animal feeds, as aeration is reduced to a minimum.

ADHESIVES, GLUE ...make possible the mechanical application of glue in large amounts, where agitation ordinarily produces troublesome quantities of foam.

Numerous products operate efficiently only when foam is effectively controlled. For wherever there are liquids containing dispersed materials, foam is a threat. Nopco's chemists have a long head start in controlling foam—have probably more experience in this important field than any other group in America. Why not give them a try at *your* most immediate production headache – in foam or wherever practical chemistry can help? Just write Technical Research Department, Nopco Chemical Company, Harrison, New Jersey.

1907–1957 50 Years OF PROGRESS IN CHEMISTRY

NOPCO

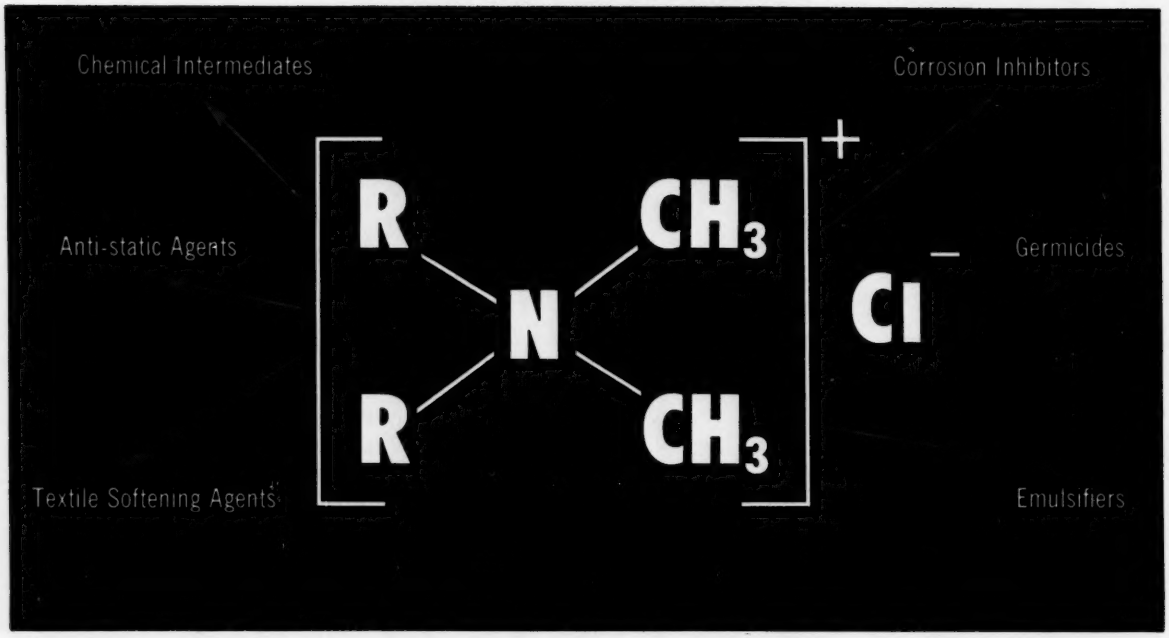
PLANTS: Harrison, N. J. • Cedartown, Ga. • Richmond, Calif. • London, Canada

Nopco processing chemicals include: Esters, Ethylene Oxide Condensates, Amides, Metallic Soaps, Sulphonates, Water Soluble Polymers, Resin and Wax Emulsions

For: Surface Lubrication • Detergency • Sizing • Plasticising • Softening • Emulsifying • Dispersing • Wetting • Defoaming • Thickening

For complete information see Chemical Materials Catalogue—Pages 373-376

interested in quaternary chemistry?



who knows what men with ideas will do with General Mills

fatty quaternary ammonium chlorides

Some of the better known, common industrial uses for General Mills fatty quaternary ammonium chlorides—our trade name, *Aliquats*—are listed above. *Creative chemists are continuing to look for new uses.* Unique characteristics of these cationic chemicals suggest many applications—one or more of which you may be able to use profitably in your operations!

General Mills fatty quaternaries have strong cationic surface activity. They are stable in both acidic and alkaline media and exhibit excellent antistatic and germicide properties.

Aliquats contain the polar nitrogen grouping and long, non-polar hydrocarbon chains. The cationic nature of the Aliquats effects their absorption on a variety of surfaces, thus imparting a hydrophobic film of superior integrity on the surface of the material thus treated.

Fatty quaternaries are always "on tap" from General Mills, basic producer of fatty acids. Enlarged plant facilities enable us to give even faster delivery of uniform, quality quaternaries.

SPECIFICATIONS

Product	Trade Name	% Quaternary Ammonia Compound	% Sodium Chloride	pH
Lauryl trimethyl ammonium chloride	Aliquat 4	48-52	1.0 max.	9 max.
Palmityltrimethyl ammonium chloride	Aliquat 6	48-52	1.0 max.	9 max.
Coco trimethyl ammonium chloride	Aliquat 21	48-52	1.0 max.	9 max.
Monotallow trimethyl ammonium chloride	Aliquat 26	48-52	1.0 max.	9 max.
Dicoco dimethyl ammonium chloride	Aliquat 221	73-77	0.5 max.	9 max.
Dihydrogenated tallow dimethyl ammonium chloride	Aliquat H226	73-77	0.5 max.	9 max.
1:1 mixture Aliquats 26 and 221	Aliquat 400	48-52	1.0 max.	9 max.

FOR MORE INFORMATION, write

CHEMICAL DIVISION

KANKAKEE, ILLINOIS

General Mills

District Offices: ***New York,*** *156 William St.* • ***Chicago,*** *460 So. N.W. Hy., Park Ridge, Ill.*

Producers of: Sterols • Fatty Nitrogens • Versamid Polyamide Resins • Fatty Acids • Methyl Esters of Fatty Acids

"J&L phosphatizes ***in-the-round?***
. . . you mean after the shell
is formed and welded?"

"Sure, how else can you properly
phosphatize the ***seam?***
J&L gives us a 100% job!"

- J&L specialists, backed up by modern research, are ready to consult on your toughest packaging problems.
- J&L, an integrated steel producer, controls container quality from start to finish.
- J&L steel containers provide engineered packaging for dependable transportation and safe storage.
- Precise fabrication and correct specification of fittings and closures.
- Prompt dependable delivery from nine plants.

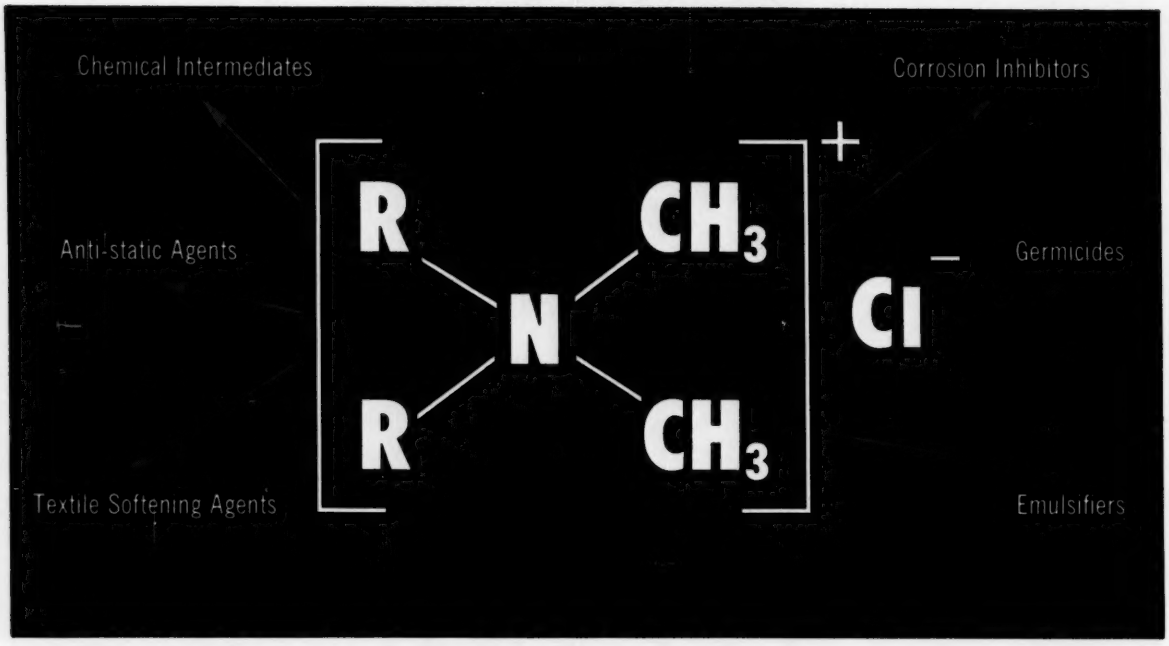
Call your nearest J&L Container Division office for recommendations on your packaging problems. Or write direct to the Container Division, 405 Lexington Avenue, New York 17, N. Y.

STEEL

Jones & Laughlin

...a great name in steel

interested in quaternary chemistry?



who knows what men with ideas will do with General Mills

fatty quaternary ammonium chlorides

Some of the better known, common industrial uses for General Mills fatty quaternary ammonium chlorides—our trade name, *Aliquats*—are listed above. *Creative chemists are continuing to look for new uses.* Unique characteristics of these cationic chemicals suggest many applications—one or more of which you may be able to use profitably in your operations!

General Mills fatty quaternaries have strong cationic surface activity. They are stable in both acidic and alkaline media and exhibit excellent antistatic and germicide properties.

Aliquats contain the polar nitrogen grouping and long, non-polar hydrocarbon chains. The cationic nature of the Aliquats effects their absorption on a variety of surfaces, thus imparting a hydrophobic film of superior integrity on the surface of the material thus treated.

Fatty quaternaries are always "on tap" from General Mills, basic producer of fatty acids. Enlarged plant facilities enable us to give even faster delivery of uniform, quality quaternaries.

SPECIFICATIONS

Product	Trade Name	% Quaternary Ammonia Compound	% Sodium Chloride	pH
Lauryl trimethyl ammonium chloride	Aliquat 4	48-52	1.0 max.	9 max.
Palmityltrimethyl ammonium chloride	Aliquat 6	48-52	1.0 max.	9 max.
Coco trimethyl ammonium chloride	Aliquat 21	48-52	1.0 max.	9 max.
Monotallow trimethyl ammonium chloride	Aliquat 26	48-52	1.0 max.	9 max.
Dicoco dimethyl ammonium chloride	Aliquat 221	73-77	0.5 max.	9 max.
Dihydrogenated tallow dimethyl ammonium chloride	Aliquat H226	73-77	0.5 max.	9 max.
1:1 mixture Aliquats 26 and 221	Aliquat 400	48-52	1.0 max.	9 max.

FOR MORE INFORMATION, write

CHEMICAL DIVISION

KANKAKEE, ILLINOIS

General Mills

District Offices: ***New York,*** *156 William St.* • ***Chicago,*** *460 So. N.W. Hy., Park Ridge, Ill.*

Producers of: Sterols • Fatty Nitrogens • Versamid Polyamide Resins • Fatty Acids • Methyl Esters of Fatty Acids

"J&L phosphatizes ***in-the-round?***
. . . you mean after the shell
is formed and welded?"

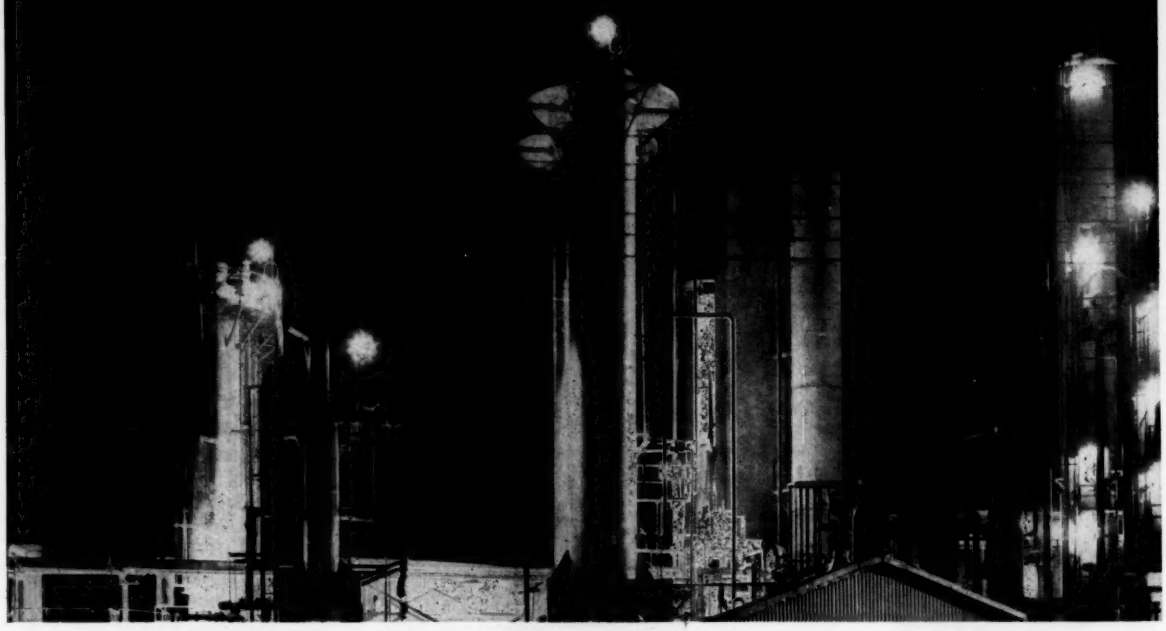
"Sure, how else can you properly
phosphatize the ***seam?***
J&L gives us a 100% job!"

- J&L specialists, backed up by modern research, are ready to consult on your toughest packaging problems.
- J&L, an integrated steel producer, controls container quality from start to finish.
- J&L steel containers provide engineered packaging for dependable transportation and safe storage.
- Precise fabrication and correct specification of fittings and closures.
- Prompt dependable delivery from nine plants.

Call your nearest J&L Container Division office for recommendations on your packaging problems. Or write direct to the Container Division, 405 Lexington Avenue, New York 17, N.Y.

Jones & Laughlin
STEEL
...a great name in steel

PROCESS SUPER DRYING SIMPLIFIED



MHI CALCIUM HYDRIDE drys materials completely in gas or liquid phase

Versatility, almost unlimited . . . effectiveness, process proved . . . MHI calcium hydride is simplifying today's "tough nut" complete drying problems! MHI calcium hydride is uniquely successful in those new processes where water *can't be tolerated.* Included are catalysis systems for polymerization, the preparation of refrigerants, aerosol propellants, pharmaceuticals, and nuclear reactor atmospheres. MHI calcium hydride has an unequaled ability to dry *completely* in unit processes involving gases, such as hydrogen, argon, helium, nitrogen, hydrocarbons, chlorinated hydrocarbons, esters, alcohols, and many other types of compounds.

HERE'S HOW IT SIMPLIFIES. Even at elevated temperatures where adsorbtive type driers are ineffective, MHI calcium hydride drys completely. Contact with MHI calcium hydride can be in stirred tanks, by percolation through a fixed bed of calcium hydride, or vapor phase through a fixed bed. Temperatures can range from below room temperature *up to 1400°F.* Contact times may be as short as a few seconds. Calcium hydride is safe and easy to use and store.

EFFECTIVENESS OF CALCIUM HYDRIDE FOR YOUR PROCESS EASILY PROVED. With your own titrimeter, you will see how MHI calcium hydride drys residual moisture down to dew points of less than —60°F or to one p.p.m. range. Metal Hydrides Incorporated will gladly provide samples upon written request.

NEW CALCIUM HYDRIDE TECHNICAL BULLETIN AVAILABLE. You may get details on complete drying with MHI calcium hydride by requesting your copy of this new bulletin.

PIONEERS IN HYDROGEN COMPOUNDS

MHI *Metal Hydrides Incorporated* CHEMICAL HYDRIDE DIVISION

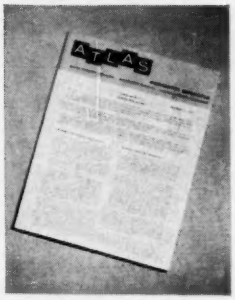
CONGRESS STREET, BEVERLY, MASSACHUSETTS

ATLAS chem-memos

CHEMICALS DIVISION
ATLAS POWDER COMPANY, WILMINGTON 99, DELAWARE
Atlas Powder Company, Canada, Ltd., Brantford, Ontario, Canada

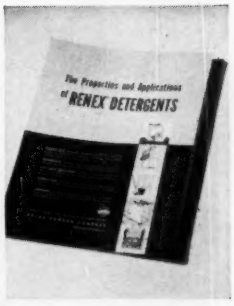
You'll find useful chemical ideas in latest Atlas technical data

How to make waterless hand cleaners



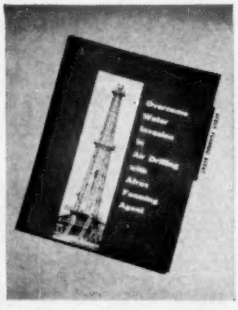
People often get their hands soiled with grease, paint or ink at times when it's not convenient to wash them. The answer to the clean-up problem is a "waterless" cleaner that you just spread on and wipe off. A new bulletin from Atlas, latest in our series of formulation news tips for the cosmetic industry, tells how to make this type of formula using Atlas emulsifiers and detergents. *For a copy, check the coupon below.*

Easy way to pick detergents



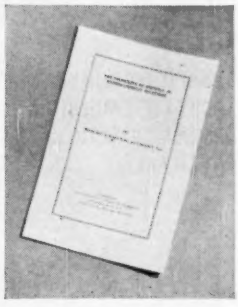
To make it easier for compounders of cleaning formulas to select the right detergent for the job, we have condensed all available data on our RENEX® non-ionic detergents in a new folder. It's a cinch to compare cloud points, surface tension, wetting time, foam height, solubilities of all 14 RENEX products at a glance. The folder makes a convenient place to file our forthcoming bulletins, too. *Get your copy, by checking the coupon below.*

Blowing bubbles for oil well drillers



Some venturesome oil drillers have been stepping up drilling rates by forcing air or gas down the hole to remove cuttings, instead of using conventional liquid "muds." To remove underground water we have developed a foaming agent called AFROX®—which converts water into a foam that is easily blown out of the hole. Data on how to use this newest of drilling chemicals made by our Aquaness Department is given in a new bulletin. *For a copy, check the coupon.*

Sorbitol solubility data for pharmaceutical manufacturers



Atlas SORBO® (sorbitol solution, N.F.) is popular as a bodying agent for liquid pharmaceuticals, which often contain alcohol. A paper published recently gives results of studies made under an Atlas-sponsored research grant, to show sorbitol's solubility in alcohol-water solutions. *Get a copy by checking the coupon.*

Dept. CW
ATLAS POWDER COMPANY
Wilmington 99, Delaware

Please send me the literature checked ▶

NAME_____ TITLE_____
COMPANY_____
STREET_____ CITY_____
ZONE_____ STATE_____

- ☐ Waterless hand cleaners
- ☐ RENEX Detergent File
- ☐ Sorbitol-alcohol solubility
- ☐ AFROX foaming agent information file

CHEMICALS OUTLOOK

December, 1957

This news bulletin about Wyandotte Chemicals services, products, and their applications, is published to help keep you posted. Perhaps you will want to route these and subsequent facts to interested members of your organization. Additional information and trial quantities of Wyandotte products are available upon request . . . may we serve you?

NEW WYANDOTTE PROPYLENE OXIDE PLANT ANNOUNCED

To meet the growing need for higher purity chemical raw materials, plans have been announced for construction of a new Propylene Oxide Plant to augment Wyandotte Chemicals' facilities at Wyandotte, Michigan.

The latest in a series of integrated plant additions, it will utilize the chlorohydrin process. Other products will include propylene dichloride and dichloroisopropyl ether. The plant is scheduled to come on stream early in the second quarter of 1958. Plant capacity has been planned to permit Wyandotte's entrance into the commercial propylene oxide market as well as to handle its captive uses.

Major applications of propylene oxide include: manufacture of propylene and polypropylene glycols and other derivatives, including oil emulsifying and demulsifying agents. The propylene oxide produced by Wyandotte will be pure enough to be used in the manufacture of Wyandotte's Pluronic* polyethers — including polyurethane-foam grades — a process requiring the highest purity of propylene oxide commercially available. It will meet the highest specifications, and be available in tank-car quantities.

This new propylene oxide plant is another progressive step by Wyandotte to make important raw materials available to industry . . . broadening the base of petro-chemical building blocks. Wyandotte has been delving deeper into this area through such products as the Pluronic series, Tetronic* polyethers, and Quadrol* (polyol).

PAPER ON VINYL ACETATE EMULSION POLYMERIZATION AVAILABLE

Wyandotte Researcher, D. M. French, recently presented a paper on the "Mechanism of Vinyl Acetate Emulsion Polymerization." Included, is a brief comparison of vinyl acetate polymerization and styrene polymerization.

The Pluronic series of nonionic surface-active agents is used in this study, because they are stable in acidic and alkaline media, have a low order of toxicity, and do not discolor in heat or sunlight.

Both particle size and distribution of the emulsion systems were studied with an electron microscope. The number and size of particles as a function of surfactant concentration and as a function of conversion are discussed in detail. The important part played by surfactant micelles is explained, and viscosity variations as affected by surfactant, particle size, and total solids are presented for consideration.

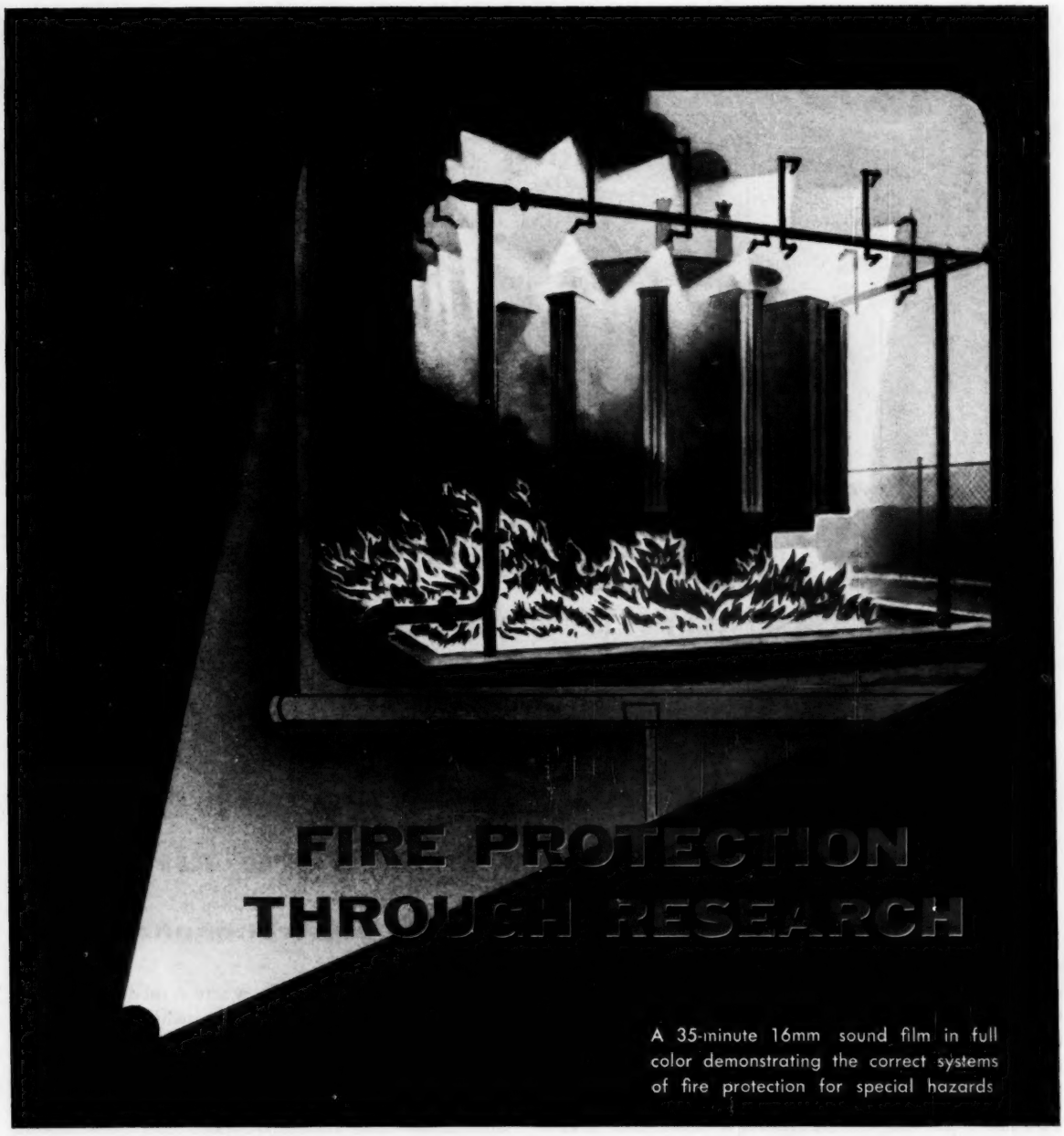
Copies of this paper are available on request.

*REG. U.S. PAT. OFF.

Wyandotte CHEMICALS

WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN • OFFICES IN PRINCIPAL CITIES

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE • MURIATIC ACID • HYDROGEN • DRY ICE
GLYCOLS • SYNTHETIC DETERGENTS (anionic and nonionic) • CARBOSE® (Sodium CMC) • ETHYLENE DICHLORIDE • DICHLORODIMETHYLHYDANTOIN
CHLORINATED SOLVENTS • *OTHER ORGANIC AND INORGANIC CHEMICALS*



A 35-minute 16mm sound film in full color demonstrating the correct systems of fire protection for special hazards

Produced by one of the oldest companies in the fire protection field, "Fire Protection Through Research" is a highly informative and interesting 16mm film. It takes you behind the scenes; explains the basic facts about fire; and then shows you how Grinnell, through research and engineering, has put this vital knowledge to practical application in the control of fire.

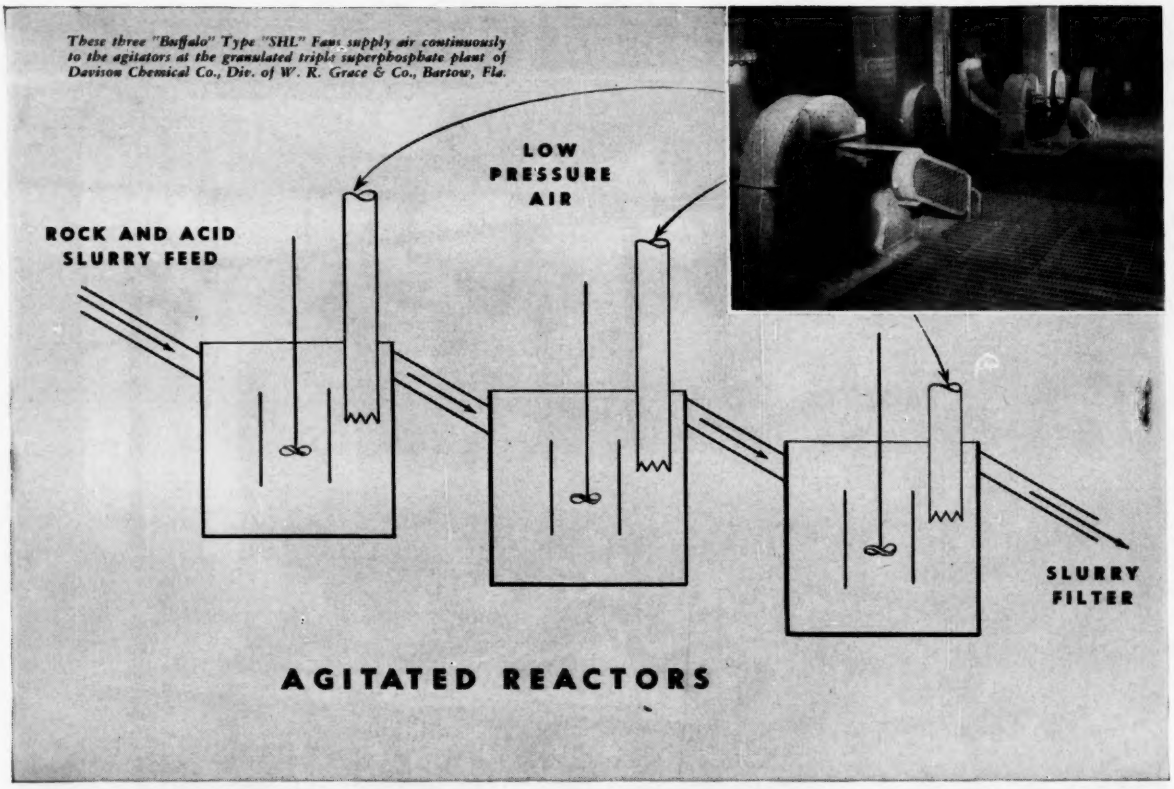
From a front-row-center seat, you can see both oil and gasoline fires intentionally set and allowed to gain full headway . . . watch them snuffed out in seconds with a variety of extinguishing agents.

Arrange a group showing of this film among interested personnel in your organization. There is no cost or obligation. To obtain a print, write directly to Grinnell Company, Inc., 277 West Exchange Street, Providence, Rhode Island.

GRINNELL

WHENEVER FIRE PROTECTION IS INVOLVED

GRINNELL FIRE PROTECTION SYSTEMS INCLUDE: • Automatic spray sprinklers—wet pipe, dry pipe, and Simplex systems • Deluge systems with automatic detection—Multitrol or Multimatic Systems • Emulsion and vapor dilution extinguishment—Mulsifyre and ProtectoSpray systems • Water spray for cooling, insulation, and controlled burning—ProtectoSpray systems • Air foam blanket—ProtectoFoam systems • Carbon dioxide systems • Dry chemical systems


These three "Buffalo" Type "SHL" Fans supply air continuously to the agitators at the granulated triple superphosphate plant of Davison Chemical Co., Div. of W. R. Grace & Co., Bartow, Fla.
LOW PRESSURE AIR
ROCK AND ACID SLURRY FEED
SLURRY FILTER
AGITATED REACTORS

REACTION TEMPERATURE controlled by low pressure air –

– in production of granulated triple superphosphate

At one stage in the production of this highly concentrated phosphate fertilizer, phosphate rock and sulfuric acid react together in a series of pre-mixer and agitator tanks. The reaction is exothermic, and must be maintained at the optimum temperature of 70° to 75° C.

This important temperature control is dependably held by large volumes of low-pressure air from the "Buffalo" Fans, blown continuously thru the slurry in the three agitator tanks — via special distributor pipes, forming bubbles which carry away the excess heat as evaporated water. Just one more place where a modern chemical plant relies on "Buffalo" for punishing air jobs, as industry has been doing for the past 80 years.

"BUFFALO" FANS FOR CHEMICAL SERVICE include efficient central-system ventilating fans, industrial exhausters, rubber-lined and resin-bonded fiber glass fans for corrosive fumes — all built to the high standards of the "Q" Factor*. Write for recommendations on your air handling or air cleaning problem. There's a modern "Buffalo" unit to solve it to satisfaction.

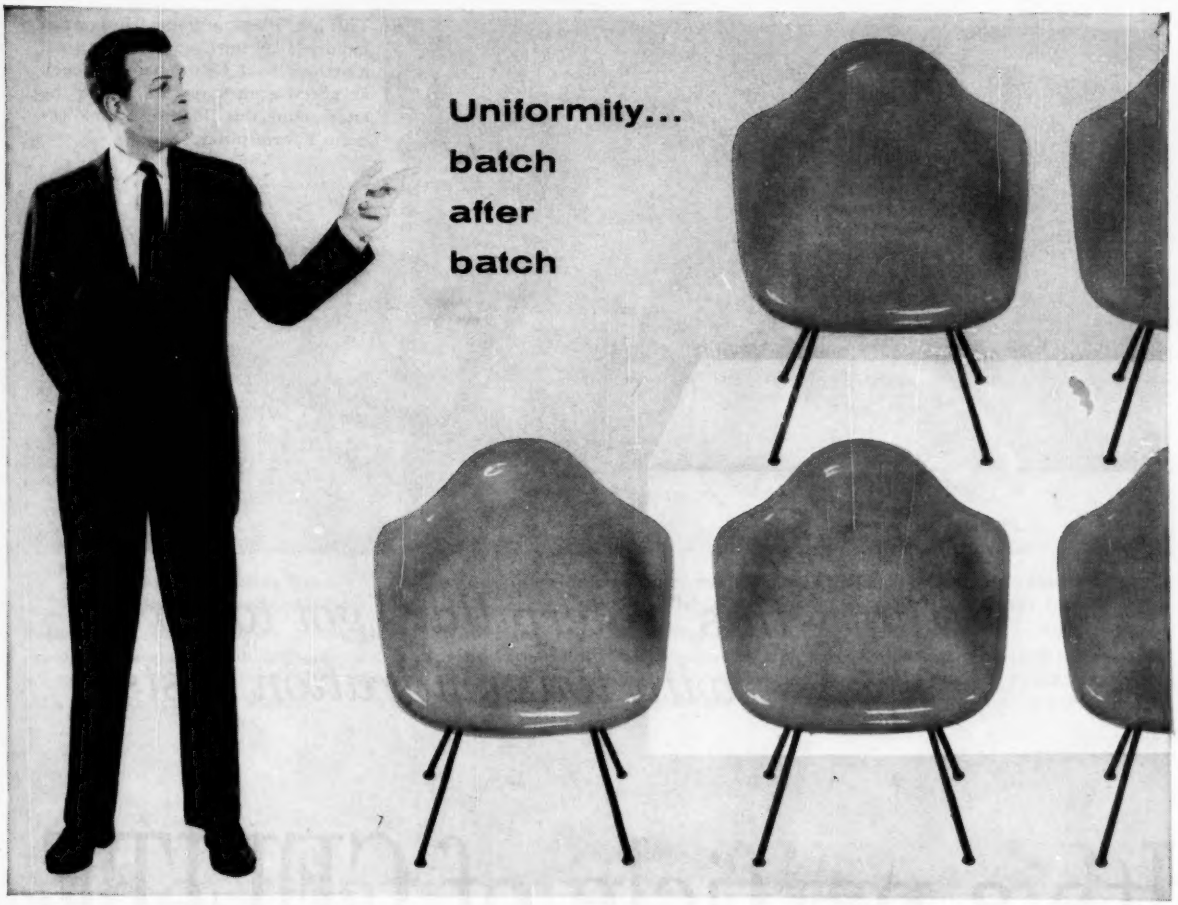
**The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.*

"Buffalo"

BUFFALO FORGE COMPANY
BUFFALO, NEW YORK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING AIR CLEANING AIR TEMPERING INDUCED DRAFT EXHAUSTING FORCED DRAFT COOLING HEATING PRESSURE BLOWING



with

NEW POLYESTER RESIN GRADE DIETHYLENE GLYCOL

Now available is a new polyester resin grade of diethylene glycol. *This* CARBIDE *diglycol is produced specifically for the manufacture of polyesters and polyurethanes.*

Here are three outstanding advantages of this new polyester-resin grade chemical.

- Narrow boiling range which demonstrates product purity
- Controlled hydroxyl content assures uniform performance in processing
- Low ethylene glycol content to give polyesters with more uniform viscosity and excellent handling properties.

These stringent specifications help you obtain uniform batches—time after time.

Remember, whether you make a saturated or unsaturated polyester resin, there's a wide selection of CARBIDE glycols to choose from. These include —Ethylene glycol, Diethylene glycol, Triethylene glycol, Propylene glycol, Dipropylene glycol, 1,2,6-Hexanetriol and 1,5-Pentanediol.

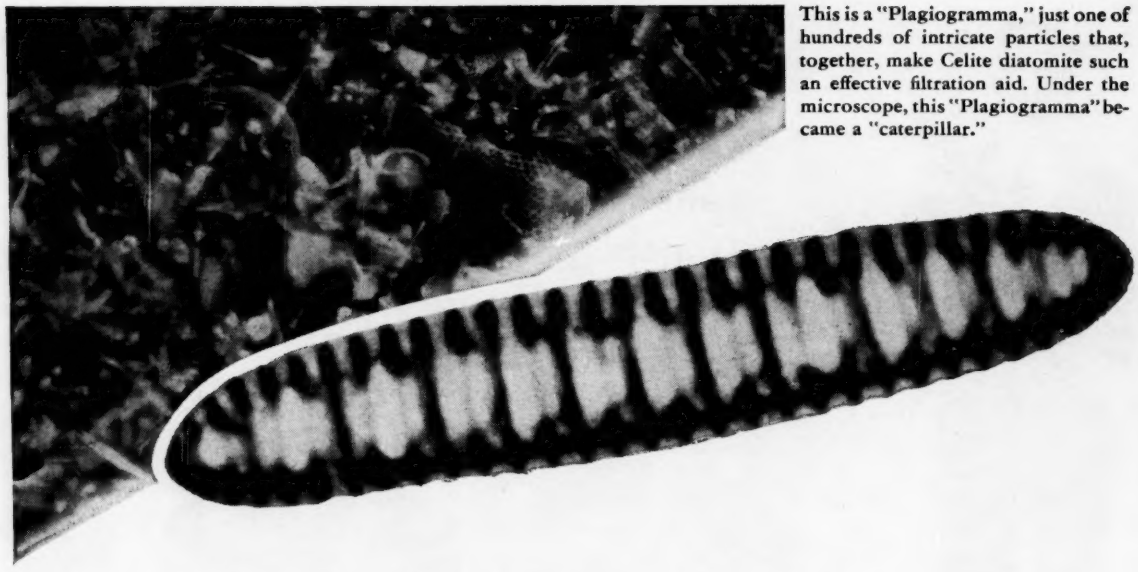
For information on these glycols—or samples — write Union Carbide Chemicals Company, Room 328, 30 East 42nd Street, New York 17, New York. In Canada: Carbide Chemicals Company, Division of Union Carbide Canada Limited, Montreal.

"Union Carbide" is a registered trade-mark of Union Carbide Corporation.

UNION CARBIDE

CHEMICALS

Union Carbide Chemicals Company
Division of Union Carbide Corporation
30 East 42nd Street, New York 17, N. Y.



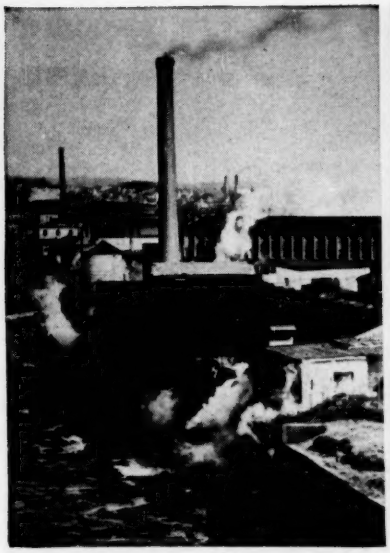
This is a "Plagiogramma," just one of hundreds of intricate particles that, together, make Celite diatomite such an effective filtration aid. Under the microscope, this "Plagiogramma" became a "caterpillar."

What's this "caterpillar" got to do with lower filtration costs?

It's a particle of CELITE that covers more

Assures highest purity in pharmaceuticals

Among the many important uses of Celite diatomite filter aids in industry today is the vital part they play in the production of life-saving antibiotics. Not only does Celite safeguard the purity of aureomycin, streptomycin and other pharmaceuticals; they also provide substantial cost savings that permit wider usage of these *wonder drugs.*



Protects communities from contaminated plant waste

Celite helps control pollution through removal of suspended solids from plant waste waters. Celite treatment often permits plants to reuse this water.

Provides greater clarity in varnish, lacquer and shellac

Celite filtration provides the high degree of clarity required in clear finishes. Celite is also widely used by the paint industry as a flatting agent and pigment extender.

Gives appetizing sparkle to syrups, jellies and other foods

Many food processors make an important *sales plus* of the outstanding brilliance that Celite provides. Celite also helps increase juice yields as a pressing aid.

-the diatomite filter aid filter surface per pound

THAT'S RIGHT. Celite* is the diatomite that gives you superior clarification at fast flow rates PLUS lower wet density. And lower wet density simply means greater surface coverage per pound of Celite. Which means substantial savings to you, for 6 bags of Celite will actually do the work of 7 bags of other diatomites.

And Celite is uniform. Every pound of it comes from Lompoc, California, the world's largest and purest diatomite deposit. Here, J-M technicians process and grade it so that no matter which convenient J-M warehouse you order from, the physical and chemical properties of each grade will never vary.

In addition, from Celite's full line of filter powders you can select the one grade that will give you the clarity you need at the highest flow rate.

So if filtration belongs in your processing operations, it will pay you to call in your local J-M Celite engineer. Backed by Johns-Manville's research facilities and years of practical diatomite experience, he can help you with your filtration problems. Call him today or write Johns-Manville, Box 14, New York 16, New York. In Canada, write 565 Lakeshore Road East, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

JOHNS-MANVILLE PRODUCTS

Johns-Manville CELITE FILTER AIDS

THE MAN WITH THE MULTIWALL PLAN

UNION PACKAGING SPECIALIST JACK BAUMAN

reduces customer's Multiwall costs $255 per carload

Have you ever "burned a Multiwall candle at both ends"? Union Packaging Specialist Jack Bauman recently helped a Pennsylvania packer accomplish something of the sort . . . reduce his Multiwall costs—by $255 per carload—and at the same time increase the overall effectiveness of his bag.

Union Multiwall Recommendations are based on this 5-star Packaging Efficiency Plan

- DESIGN
- EQUIPMENT
- CONSTRUCTION
- SPECIFICATION CONTROL
- PLANT SURVEY

The savings came through recommendations for: (1) A completely new bag design. This increased the merchandising value of the Multiwalls. Customer's top executives called it "the best design we've ever seen in the industry." (2) Reduced bag construction. Lowering the basis weight enabled customer to cut his Multiwall Bag costs. And, (3) using Union's new "Diamond-O" closure which resulted in greater operating efficiency and a trimmer package.

Union's 5-Star Multiwall Plan has helped many companies get more for their Multiwall dollar. See how this simple proposal operates, how it can help you. We'll be glad to send details.

Better Multiwall performance through better planning

union camp

UNION'S PACKAGE ENGINEERING DEPARTMENT will study your Multiwall bagging methods and equipment and make appropriate recommendations, regardless of the brand of Multiwalls you are now using.

UNION MULTIWALL BAGS

UNION BAG-CAMP PAPER CORPORATION

233 BROADWAY, NEW YORK 7, N. Y.

Eliminate FISH EYES from your product with ESCAMBIA PVC

With Escambia you also get freer-flowing hot pre-mixes, better heat stability and improved color and clarity.

Prove these unique advantages in your own plant with a test run of the Escambia PVC resin best suited to your operation:

ESCAMBIA PVC 1250—High molecular weight resin, recommended for dry blend extrusion of shapes and profiles and for calendered film.

ESCAMBIA PVC 1225—The inherent heat stability of this intermediate molceular weight resin gives properties comparable to those usually associated with higher molecular weight PVC.

ESCAMBIA PVC 1200—Lowest molecular weight in this series with outstanding heat stability not generally associated with resins of this molecular weight. It is recommended for calendering, extrusion and molding when lower processing temperatures are required.

NEED A SPECIAL TYPE PVC? Your needs for a special type of PVC will get prompt attention at Escambia. The answer to your production problem may be among the many types of specialty PVC's developed by Escambia's research department: modified and unmodified low molecular weight PVC, conventional and novel copolymers, PVC's for various rigid applications and others. Direct your inquiries to the address below.

For additional information about Escambia's PVC resins—write or call—

ESCAMBIA CHEMICAL CORPORATION

261 MADISON AVENUE • NEW YORK 16, N. Y.

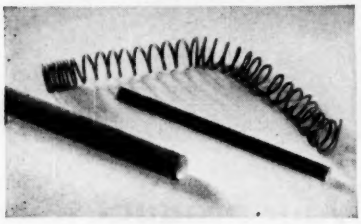
RARE EARTH RESEARCH

Recent interesting rare earth research developments

a report by LINDSAY

We are frequently fascinated by the imagination of researchers who are working with the rare earths. It appears that technical people, observing the many essential uses of rare earth salts in chemical and industrial processes, are looking at these fifteen unique elements as a fertile field for exploration.

During recent years, rare earths have been accepted as basic chemical tools in a wide cross section of American industry. This suggests that fruitful results may be expected from the rare earth research projects currently being carried on in industrial laboratories and pilot plant operations from coast to coast. Here, for instance, are half a dozen which may interest you.



MILES OF MISCH. This isn't a new application, but we're wondering if you know that misch metal (an alloy of the mixed rare earths) is available in wire form as well as in ingot and rod form? Cerium alloys can also be had in powder form; they are used as getters in vacuum tubes. We don't make the metal, but we can put you in touch with those who do.

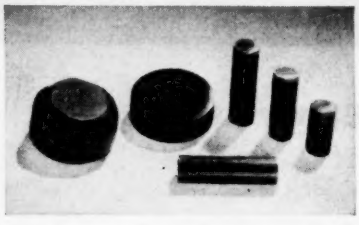
FLAME SPRAYING. A new process for flame spraying various refractory oxides on metallic surfaces has been brought to near completion. Titania, zirconia and alumina can be flame sprayed, but the thing that interests us is that flame sprayed cerium oxide has some unusual properties. Rare earth oxide is a good heat radiation material, and it seems that metallic surfaces coated with rare earth oxide radiate heat much faster than do untreated surfaces.

RARE EARTHS IN PLASTICS. We frankly don't know what sort of things rare earth-impregnated plastics could be used for, but a couple of people have taken enough interest in this problem to make up experimental samples. We've been doing some playing with them ourselves and have some ideas about using them. Polyethylene, for example, can be fabricated to hold up to 5 to 10 times its weight of rare earth oxide, and we've even seen some precision-bore epoxy tubing made with a rare earth oxide filler.

SEPARATION AND SAMARIUM. We are like a slaughter house in that we would like to use everything that a rare earth separation process turns out, including the squeal. With the interest that has been generated in using gadolinium as a neutron absorber (thermal cross section about 46,000 barns), we have accumulated quite a pile of samarium oxide in rather decent purity. In the process of separating gadolinium and some of the other rare earths, samarium is produced as a by-product. If you can think of a use for samarium, we have the samarium compounds.

RARE EARTH GARNETS. These are structurally somewhat similar to the garnet variety grossularite (formula $Ca_3Al_2(SiO_4)_3$). The most interesting ones are the rare earth-iron garnets such as $Y_3Fe_2(FeO_4)_3$. This mouthful of formula has been abbreviated by researchers to "YIG" for obvious reasons. Other names stem from other rare-earth symbols. These garnets, particularly those of yttrium, gadolinium, erbium, and some others have interesting ferromagnetic properties, making them useful as ferrite materials in electronic equipment. We don't make the garnets, but we do make the rare earth oxides needed to prepare them.

SINTERED SHAPES. One of our friends once wanted to know if rare earth oxides could be pressed and sintered into shaped pieces. Apparently they can, and our friend made up some experimental hot-pressed rare earth oxide and cerium oxide pieces for us.



Lindsay produces thorium and rare earth salts in purities up to 99.99% for a rather surprising variety of chemical and industrial applications. Most of these materials are available for prompt shipment in quantities from a gram to a carload.

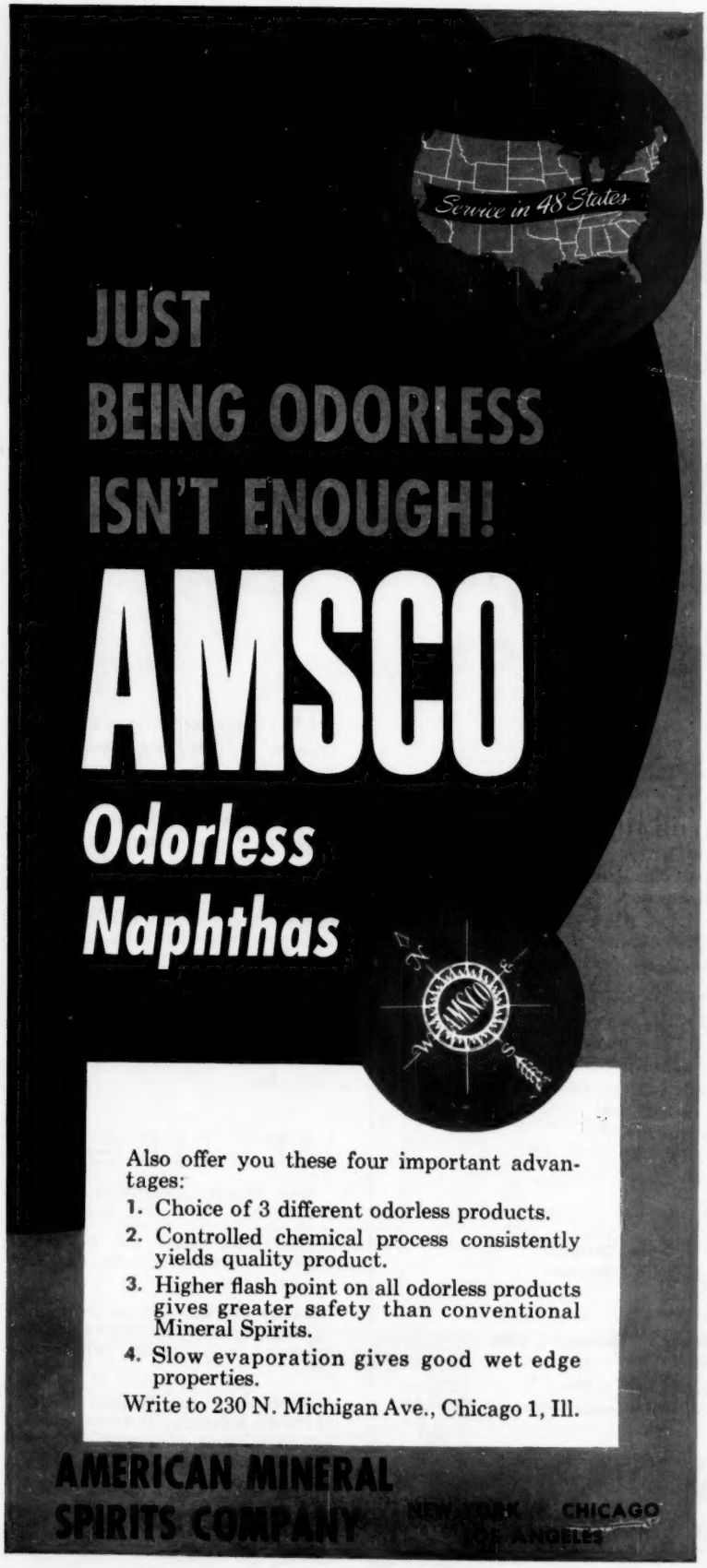
We will be pleased to supply your research and process development people with technical data, analyses, prices and whatever may be helpful to you in exploring the possibility of the profitable application of rare earths to your own problems.

PLEASE ADDRESS INQUIRIES TO:

LINDSAY CHEMICAL COMPANY

World's Largest Producer of Thorium and Rare Earth Chemicals

270 ANN STREET, WEST CHICAGO, ILLINOIS


Service in 48 States
JUST
BEING ODORLESS
ISN'T ENOUGH!
AMSCO
Odorless
Naphthas
Also offer you these four important advantages:
1. Choice of 3 different odorless products.
2. Controlled chemical process consistently yields quality product.
3. Higher flash point on all odorless products gives greater safety than conventional Mineral Spirits.
4. Slow evaporation gives good wet edge properties.
Write to 230 N. Michigan Ave., Chicago 1, Ill.
AMERICAN MINERAL SPIRITS COMPANY
CHICAGO

OPINION

Schwarz Makes AET

To THE EDITOR: The Oct. 19 issue . . . carries an article on radiation protection, which discusses AET and mentions the important contribution to this work by Dr. David Doherty at Oak Ridge. This we are pleased to see. However, we should like to call your attention to the fact that Abbott Laboratories is not the only present producer of AET.

As the enclosed postcard will indicate, we do not even believe that they were the first commercial producers. The postcard was mailed to more than 7,000 medical and biochemical scientists throughout this country and abroad. Those who read your article might come to the conclusion that we are purchasing the compound from Abbott and reselling it, which is certainly not the case.

Schwarz Laboratories has been interested in sulfhydryl compounds in radiation protection for 15 years—an interest that considerably predates that of Abbott Laboratories.

DAVID R. SCHWARZ
Vice-President
Schwarz Laboratories, Inc.
Mount Vernon, N. Y.

Fungicide Patent

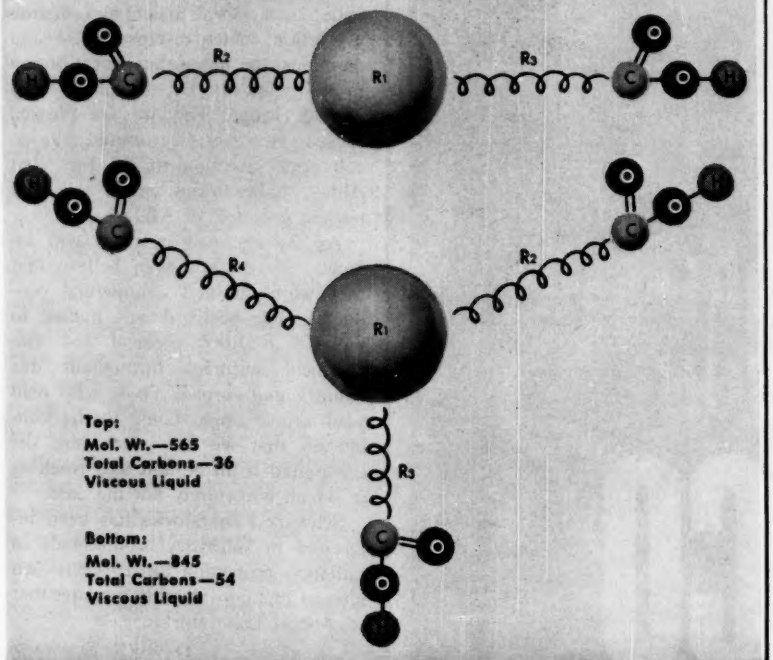
To THE EDITOR: Your reporting of the injunction against Roberts Chemicals, Inc. (*Nov. 2, p. 48*), was in error in a major respect, and we believe you will want to correct this error. We are enclosing a letter we have sent to our customers and a copy of the injunction in question, which should explain the situation.

Briefly, we are enjoined from making, using and selling for any of the

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

Want a Di- or Polybasic Acid that is DIFFERENT?



Then try EMPOL® POLYMERIZED ACIDS!

Relatively low in cost, these viscous liquids offer a very unusual combination of high molecular-weight and polyfunctionality that should be of extreme interest to manufacturers of resins, polyesters, polymers and similar type materials for many fields of application. Such fields already include adhesives, coatings, corrosion inhibitors, de-emulsifiers, emulsifying agents, films, foams, lube additives, elastomers and surface coatings.

In addition to commercial Empol 1022 which contains 75% dibasic and 22% tribasic acids, Emery offers several "development" grades that are essentially all dibasic or tribasic. This added flexibility of composition offers additional opportunities for research in new fields as well as the fields where the commercial product is already used. Mail coupon below for complete literature on Emery Polymerized Acids.

Emery

Organic Chemical
Sales Department

Emery Industries, Inc., Carew Tower, Cincinnati 2, Ohio

Emery Industries, Inc., Dept. I-12A Carew Tower, Cincinnati 2, Ohio
Please send literature on Emery Polymerized Acids. I am especially interested in ☐ dibasic, ☐ polybasic materials for.....
Name.....Title.....
Company.....
Address.....
City.....State.....

OPINION

purposes covered by the patent. The patent covers only the application to living plants. We are free to sell for any other use, and enclosed is descriptive literature that covers many uses.

The major interest in the agricultural field is for soil application and for use in preparing tank-mix ethylene thiuram disulfide. This latter material is a very effective fungicide and in no way infringes on the Rohm & Haas patent.

The situation is far too complicated to try to report in detail, but we do want to say that we are continuing to manufacture and sell the same products, which Rohm & Haas officials have conceded are not fungicidal compositions.

We have notified both the district court and Rohm & Haas that we are doing so. . . .

ELMER A. FIKE
President
Roberts Chemicals, Inc.
Nitro, W. Va.

CW's *statement that "Roberts is enjoined . . . . etc." was based directly on the final judgment in this case but omitted a key proviso. A more explicit summation of the injunction might read: Defendants are enjoined from making, using, or selling, for any of the fungicidal purposes expressed in reissue patent No. 23,742 . . . . . any fungicidal composition having as an active ingredient nabam, zineb, or any other salt of an alkylene bisdithiocarbamic acid, or otherwise infringing upon any claim of United States reissue patent No. 23,742.*—ED.

MEETINGS

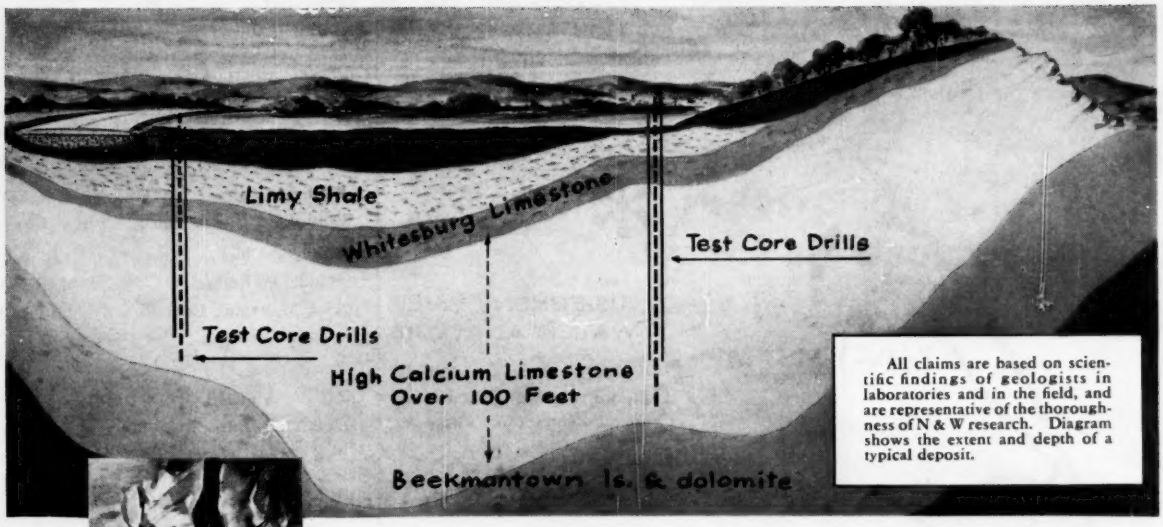
Soap Industry Convention, Waldorf-Astoria, New York, Jan. 22-24.

Plant Maintenance and Engineering Show, International Amphitheatre, Chicago, Jan. 27-30.

Society of Plastics Engineers, meeting on Progress Through Plastics Engineering, Sheraton-Cadillac Hotel, Detroit, Jan. 28-31.

Reinforced Plastics Division of Society of Plastics Industry, 13th annual technical and management conference, Edgewater Beach Hotel, Chicago, Feb. 4-6.

American Chemical Society, Philadelphia section, second Delaware Valley regional meeting, Sheraton Hotel, Philadelphia, Feb. 5.



All claims are based on scientific findings of geologists in laboratories and in the field, and are representative of the thoroughness of N & W research. Diagram shows the extent and depth of a typical deposit.

Open Sesame to LIMESTONE

Vast deposits of limestone, testing more than 97.5% pure calcium carbonate, are easily accessible for economical mining in The Land of Plenty. Some of the beds exceed 100 feet in thickness, and in one location alone the supply is estimated at more than 100 million tons.

Whatever your limestone requirements — high calcium or dolomitic — it will pay you to consider these huge top-grade deposits. If you're planning a new plant, get the facts on limestone in The Land of Plenty and the area's many other compelling industrial advantages.

Norfolk and Western plant location specialists — with many years of experience in helping plants of all sizes find *profitable* locations — are as near as your telephone. Just tell them what you need — let them do the rest. There's no obligation, and anything you tell them will be in strict confidence.

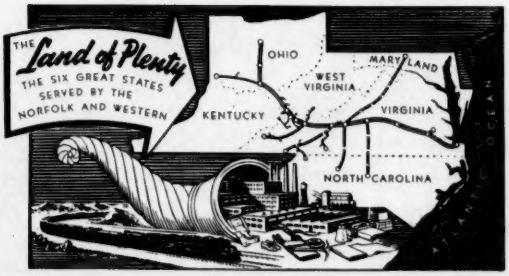
And here are typical analyses *

	DNL-1-1	DNL-1-2	DNL-1-3
SILICA (SiO_2)	.36%	.30%	.34%
IRON OXIDE (Fe_2O_3)	.072	.043	.049
ALUMINA (Al_2O_3)	.21	.20	.19
LIME (CaO)	55.00	54.90	55.40
MAGNESIA (MgO)	.65	.62	.51
SULPHUR (S)	.012	.011	.015
PHOSPHORUS (P)	.006	.006	.009
IGNITION LOSS	43.20	43.50	43.20
CALCIUM CARBONATE (Calculated)	97.90	97.72	98.51
MAGNESIUM CARBONATE (Calculated)	1.36	1.30	1.07

* Report prepared by Pittsburgh Testing Laboratories, Pittsburgh, Pa.

Write, wire or call—

L. E. Ward, Jr., Manager
Industrial and Agricultural Dept.
Drawer CW-790 (Phone Diamond 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia



Norfolk and Western RAILWAY

ALLEGHENY RIVER WATER ANALYSIS

Sample collected 12-27-56, at Armstrong Power Station by West Penn Power Company.

pH value	7.5	
Methyl red alkalinity	25	ppm
Hardness	48	"
Dissolved solids	75	"
Silica as SiO_2	5.2	"
Iron as Fe	0.05	"
Calcium as Ca	18.0	"
Magnesium as Mg	0.5	"
Sodium as Na	6.0	"
Chlorides as Cl	12.0	"
Sulphates as SO_4	19.0	"
Bicarbonates as HCO_3	30.0	"

*WE DROP THIS HINT

concerning your next plant location

Typical of the kind of factual information we can furnish you on WESTern PENNsylvania is the water analysis above. Six rivers in the area provide ample water for processing, plus labor with better-than-average technical skills, nationally known research facilities, excellent water and rail transportation. They're worth your careful investigation!

Get the WESTern PENNsylvania Story

Dept. CW-2

Area Development Department
West Penn Power Company
Cabin Hill, Greensburg, Pa.

Please send me copies of your publications:
____ "Facts about WESTern PENNsylvania"
____ "Cut Freight Costs by locating in WESTern PENNsylvania"

Name _____ Title _____

Company _____

Address _____

City and State _____

WEST PENN POWER

an operating unit of the WEST PENN ELECTRIC SYSTEM

Chemical Week

Publisher ..... Wallace F. Traendly
Editorial Director Sidney D. Kirkpatrick
Editor-in-Chief Howard C. E. Johnson
Managing Editor .... Ralph R. Schulz
Asst. Managing Editors William Olcott, J. Robert Warren

ASSOCIATE EDITORS
Donald P. Burke Anthony J. Piombino

DEPARTMENTS
Administration C. R. McCarthy, *editor;* Leo J. Northart
Business News ... Homer Starr, *editor;* Robert L. Porter
Engineering Kenneth C. Wilsey, *editor;* Philip A. Untersee
Markets ..... Jorma Hyypia, *editor;* Frank S. Sciancalepore
Production .. Herbert C. Short, *editor*
Reports .. Vincent L. Marsilia, *editor*
Research .... Joseph F. Kalina, *editor;* Sanford J. Durst
Sales ..... John M. Winton, *editor*
Specialties Richard J. Callahan, *editor;* Mary Thompson
Buyers' Guide .. Mary C. Folsom, *editor*
Copy ..... William Mullinack, *editor*
Art ..... R. D. S. Marshall, *director;* Peter Madden

EDITORIAL ASSISTANTS
Nina Seawick, Frances Regan
Dolores Able, E. L. Sisley

REGIONAL EDITORS
Far West .. Emil J. Mikity, San Francisco
Southwest ..... James A. Lee, Houston

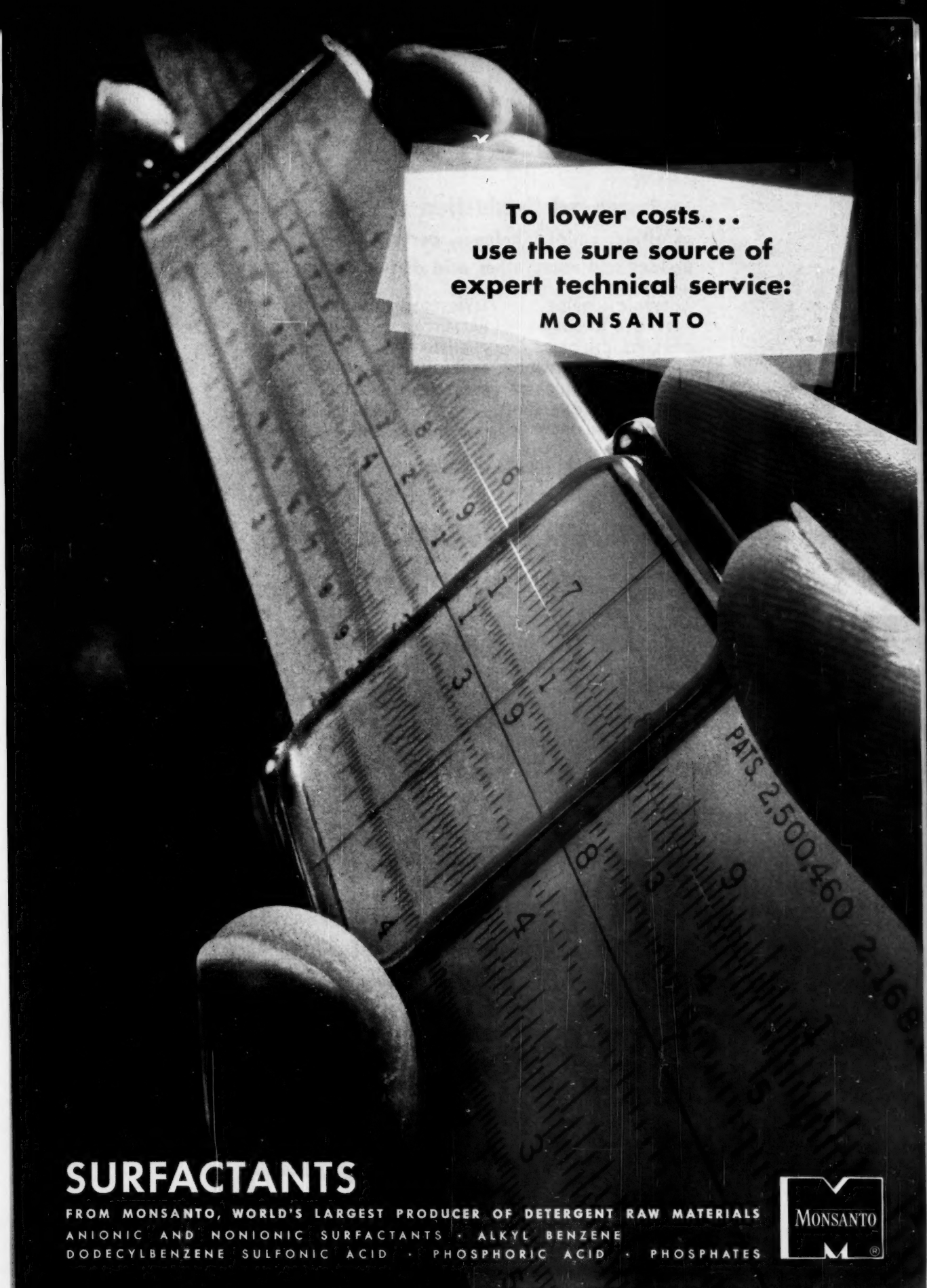
NATIONAL NEWS
Economics .... Dexter M. Keezer, *director*
Correspondents in 75 principal cities.

WORLD NEWS
Editor ..... John Wilhelm
Correspondents in 61 principal cities.

Circulation Manager .... Paul W. Erb

A McGRAW-HILL PUBLICATION

Advertising Sales Manager Robert S. Muller
Business Manager ..... Alvin J. Babkow
Advertising Makeup .... Robert L. Maier
Promotion Manager ..... Fred E. Lesner
Market Service ..... Irene Montz
Advertising Salesmen ..... See Page 124

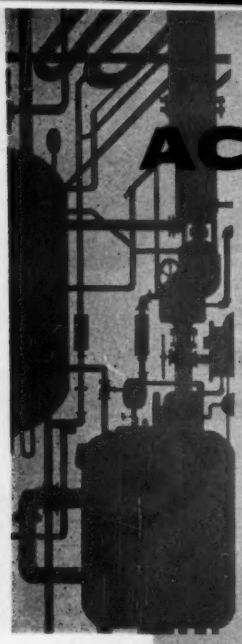


SURFACTANTS

FROM MONSANTO, WORLD'S LARGEST PRODUCER OF DETERGENT RAW MATERIALS

ANIONIC AND NONIONIC SURFACTANTS · ALKYL BENZENE
DODECYLBENZENE SULFONIC ACID · PHOSPHORIC ACID · PHOSPHATES

MONSANTO ®



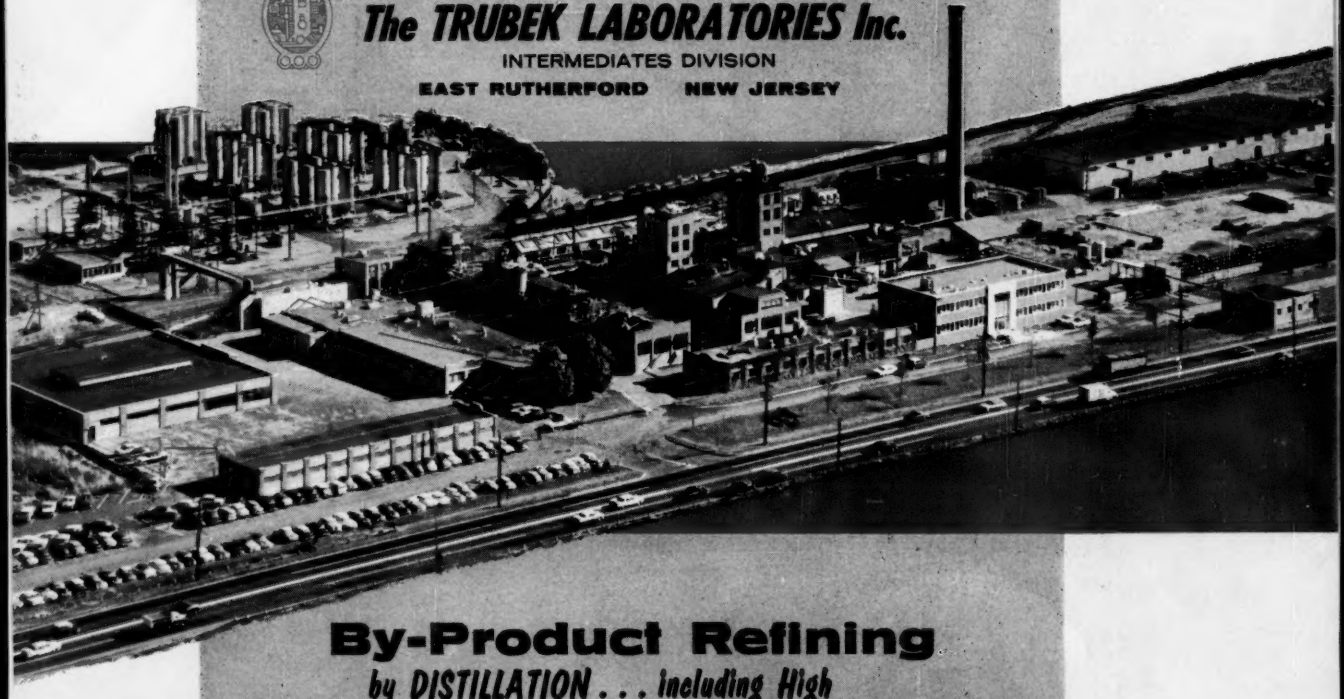
ACID CHLORIDES
(RCO Cl)

for Improved Production
of esters, amides, ketones, peroxides, ureides and many other acid derivatives

ACETYL CHLORIDE	MYRISTOYL CHLORIDE
BUTYROYL CHLORIDE	PALMITOYL CHLORIDE
CAPROYL CHLORIDE	PHENYLACETYL CHLORIDE
CAPRYLOYL CHLORIDE	PROPIONYL CHLORIDE
CINNAMOYL CHLORIDE	STEAROYL CHLORIDE
ISOBUTYROYL CHLORIDE	and
LAUROYL CHLORIDE	others, made to order

Available carload, less carload

The TRUBEK LABORATORIES Inc.
INTERMEDIATES DIVISION
EAST RUTHERFORD NEW JERSEY



By-Product Refining
by DISTILLATION . . . including High Temperature and High Vacuum . . .

rendered on a toll basis — or by the outright purchase of the starting by-product.

The facilities and experience of Truland may be employed advantageously for the economical upgrading and disposal of solvent mixtures and organic by-products.

Our technically trained personnel are available to discuss the refining of any solvent mixture or organic by-product.

TRULAND CHEMICAL CO., INC.
EAST RUTHERFORD NEW JERSEY

TRULAND

Division of **THE TRUBEK LABORATORIES** Incorporated

Send *for new booklet which describes our operation*

Business Newsletter

CHEMICAL WEEK
December 14, 1957

Start of a new Congressional struggle over tariffs and foreign trade is drawing four chemical industry representatives to Washington this week. Scheduled to appear this Friday (Dec. 13) in the warmup session being held by Rep. Hale Boggs (D., La.) and his Ways & Means Subcommittee: Richard Hansen, Allied Chemical & Dye, representing Manufacturing Chemists' Assn.; P. K. Lawrence, Du Pont, speaking for Synthetic Organic Chemical Manufacturers Assn.; Thomas Cabot, Godfrey L. Cabot Co.; T. G. Hughes, Oronite Chemical Co.

Meanwhile, the Eisenhower Administration—which has just now spelled out the details of its proposals for renewal of the reciprocal trade agreements act—is switching its strategy in this field.

Under the new plan, the Commerce Dept. is taking over administration of trade programs. This is aimed at taking the wind out of protectionists' arguments that trade policy is being handled by State Dept. "visionaries" promoting unrealistic foreign-aid programs. Consulting on foreign-trade problems will be a new 60-member advisory committee.

The Administration has also settled on what it will ask of Congress next month:

- Five-year extension of the reciprocal trade act. This is aimed at giving continuity to liberal trade policies.
- Authority to cut any duty now in effect by 5% each year, or a total cutting authority of 25% over the five-year period.
- Alternatively, power to cut *ad valorem* duties by 3% (but not by more than one percentage point in any given year).
- Continuation of present authority—so far largely unused—to cut any tariff higher than 50% *ad valorem* down to that level.
- Greater power to raise tariffs to help industries threatened by imports, and speedier escape clause proceedings.

•

Sequoia Process Co., pioneer in irradiation of polyethylene, is up for sale. The Redwood City, Calif., company will likely be purchased this month by Mandrell Industries (Houston, Tex.), maker of electronic instruments. Sequoia, which developed the Hyrad process for irradiating polyethylene products, and later granted Grace Chemical exclusive, worldwide license to it, employs the process itself in the treatment of polyethylene insulation on some of its wire and cable products.

•

Polyethylene—for yarn—also figures in the news. U. S. Rubber's latest venture is the production of the polyethylene textile fiber. Before year's end, production will begin at its Providence, R. I., plant.

Business
Newsletter
(Continued)

But another plastic has lost favor—with one manufacturer, at least. Bakelite Co., division of Union Carbide Corp., says it will stop making polyester resins before Jan. 1. Reason: Bakelite figures the future market for reinforced plastics is brightest in other areas, such as epoxy and phenolic resins (*see also p. 85*).

•

An aromatics recovery unit may be Sinclair Refining Co.'s next move. Sinclair is studying feasibility of such a unit at its Houston plant. The project would cost about $8 million, turn out 50 million lbs./year of para-xylene. Speculation is that Du Pont might be the big customer. Du Pont is the sole producer of Dacron, for which *p*-xylene is the starting point.

•

A union moratorium on wage boosts in the chemical industry? "No!" is the reaction of chemical process field labor unions to the recent suggestion by Richard Gray. Gray, president of AFL-CIO's Building and Construction Trades Dept., offered the idea as an anti-inflation measure.

But in Atlantic City for the AFL-CIO convention ending this week, representatives of International Chemical Workers Union and the Oil, Chemical & Atomic Workers roundly denounced Gray's proposal. In particular, OCAW President O. A. (Jack) Knight declared that a union is no more able to agree to keep the status quo on wages without an assurance that the rising cost-of-living will be checked than a manufacturer is able to cut '58 prices without assurance of lower costs of materials.

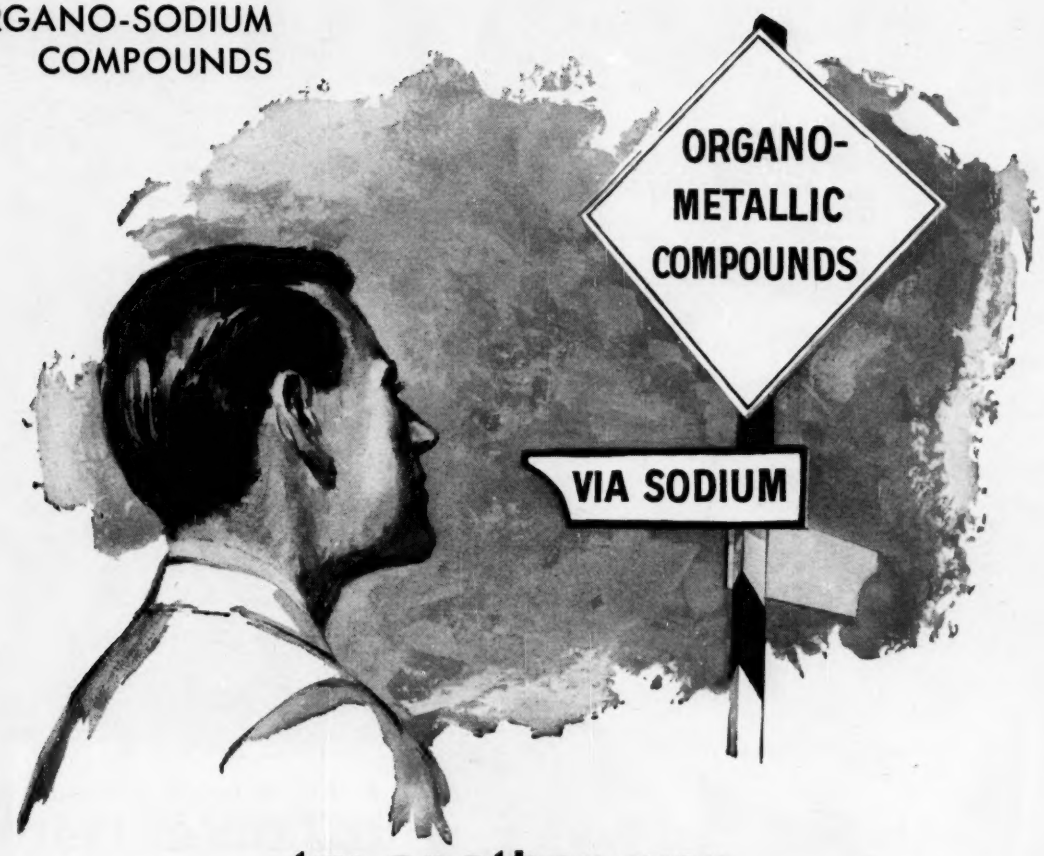
Putting this sentiment into writing, the joint ICWU-OCAW bargaining council for locals at 21 American Cyanamid plants has resolved to seek "substantial" wage boosts next year. This council asserts that such increases are "more than justified" by declining labor costs per unit of production and by the need to bolster consumer buying power. The council also decided to try to work out a program to alleviate effects of layoffs; endorsed the union shop clause as a bargaining goal; and set up a strike aid system.

•

First figures on output of automotive waxes and cleaners show there's a strong trend toward use of chemical-type cleaners and cleaner-polish combination products without use of a follow-up waxing. A 23-company survey made by Chemical Specialties Manufacturers' Assn.—in session this week at Hollywood Beach Hotel, Hollywood, Fla.—reveals that sales of cleaners and cleaner-waxes averaged 0.8 cans/car/year, whereas sales of straight waxes averaged only 0.18 cans/car/year.

Among liquid products, numbers of consumer-size units produced in '56: prewax cleaners, 9.2 million; polish-and-cleaner (no wax content), 13.8 million; cleaner-and-wax, 6.3 million; straight wax, 3.4 million; chromium cleaner, 18.7 million. Data on paste forms: prewax cleaner, 1.4 million; straight wax, 6.2 million; cleaner-and-wax, 13 million; others, 0.9 million.

ORGANO-SODIUM COMPOUNDS



try another way

For higher yield, greater economy, ease of handling in synthesizing organo-metallic compounds, try sodium dispersions as your starting point.

Sodium, for example, can be reacted with organic halides to produce organo-sodium compounds. These, in turn, react with metallic halides to yield the desired organo-metallic compounds.

The recent development of simple and effective techniques for laboratory or plant preparation of sodium dispersions is creating wide interest in the use of organo-sodium compounds.

The coupon below will bring detailed information or one of our experienced Chemical Engineers to discuss your needs at first hand.

ETHYL CORPORATION
Chemicals for industry
100 PARK AVENUE, NEW YORK 17, N. Y. • CHICAGO • TULSA • LOS ANGELES

ETHYL SODIUM METALLIC ETHYL CORPORATION

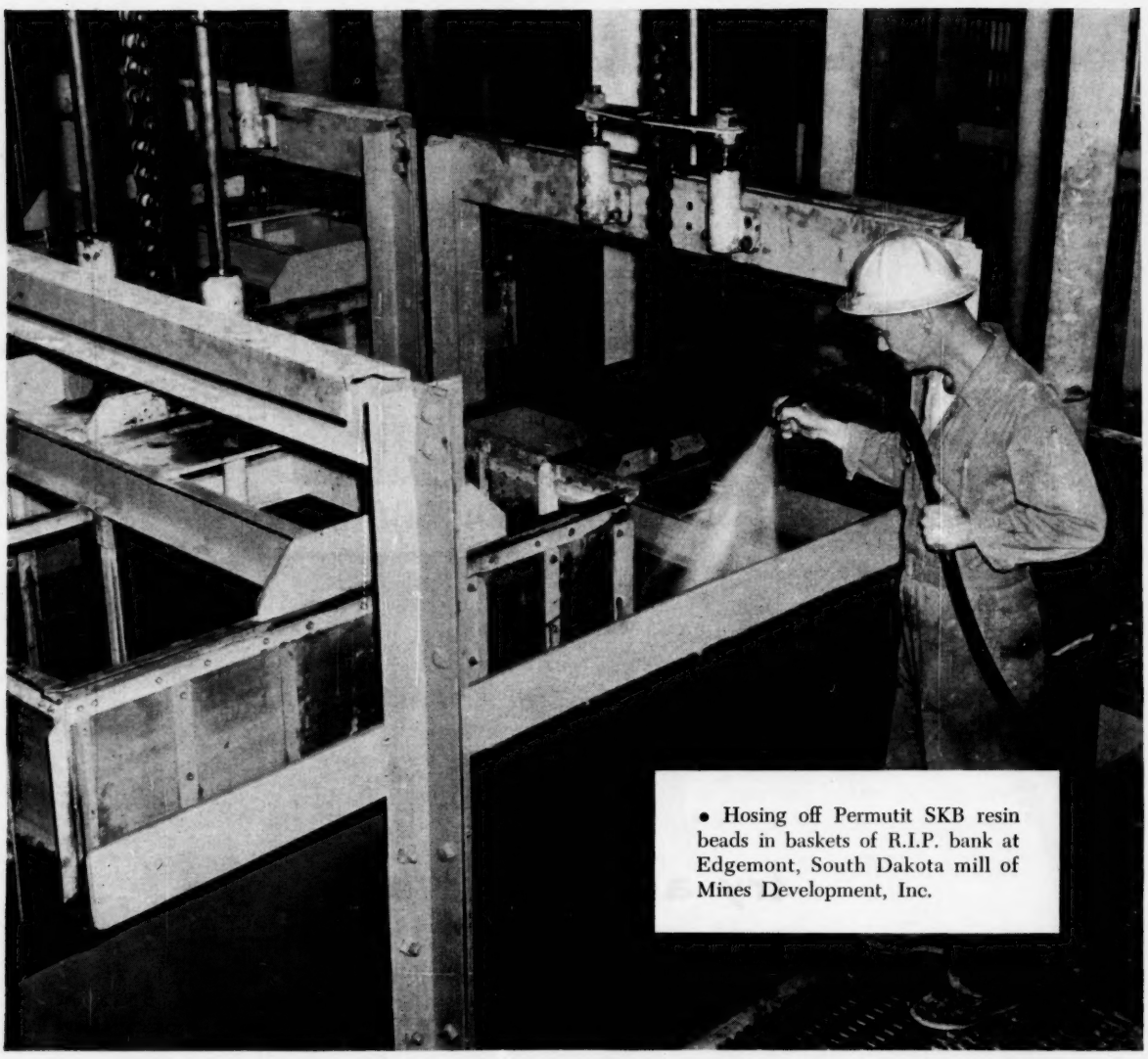
ETHYL CORPORATION
100 Park Avenue, New York 17, N. Y.

☐ Please send brochure "Sodium Dispersions"

☐ Please have Engineer call

NAME_____
FIRM_____
ADDRESS_____
CITY_____ STATE_____

CW 12-14-57



• Hosing off Permutit SKB resin beads in baskets of R.I.P. bank at Edgemont, South Dakota mill of Mines Development, Inc.

Edgemont R.I.P. mill loads 4 lb. of U_3O_8 per cu. ft. of Permutit SKB resin!

• Here's how low-slime pulp and Permutit SKB ion-exchange resins are producing at Mines Development's efficient mill: a loading of 4.0 lb. of uranium oxide per cu. ft. of resin, a concentration of 10 to 12 grams of uranium oxide per liter of eluate, and an R.I.P. uranium recovery of 99.7 per cent with a minimum of iron, vanadium and aluminum impurities.

It's proof of Permutit SKB resin's high uranium capacity and recovery ratio under actual production conditions. It explains why a number of R.I.P. mills have switched to this unique resin.

Permutit SKB was developed especially for R.I.P. uranium extraction. It disperses well, preventing "blinding" of the baskets and improving resin-pulp contact. Its unique chemical structure gives it fast loading for high recovery, high capacity and fast elution. This results in extremely high concentrations of recovered uranium, particularly in nitrate elution systems. It also means low precipitation costs and a high purity uranium.

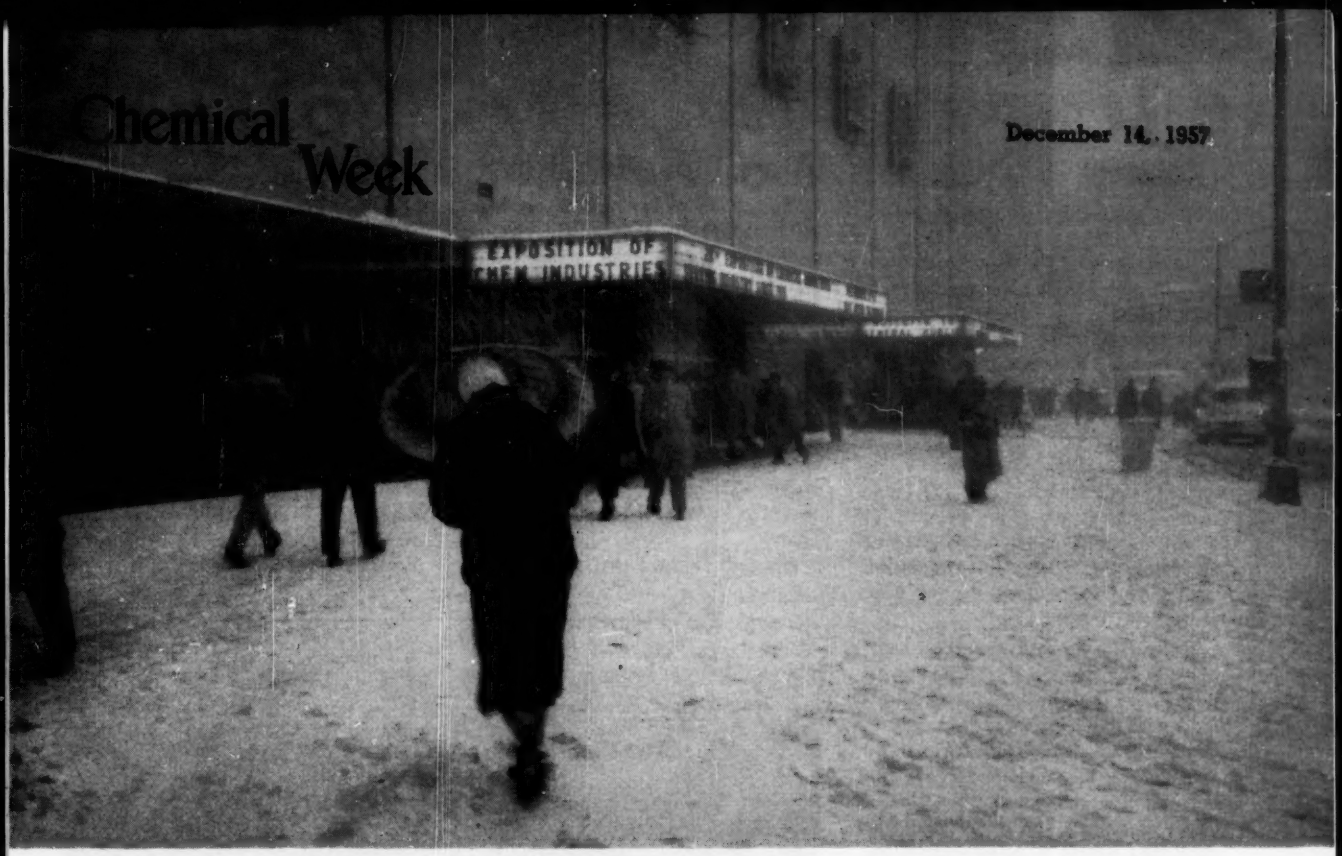
Permutit SK (finer mesh than SKB) offers the same chemical advantages when used for uranium extraction in ion-exchange columns.

We'll supply full details and samples to help you evaluate Permutit SK, SKB or other ion exchange resins. Write: The Permutit Company, Dept. CW-12, 50 West 44 St., New York 36, N. Y. or The Permutit Company of Canada, Ltd., Toronto 1, Ontario.

PERMUTIT®
rhymes with "compute it"
A DIVISION OF PFAUDLER PERMUTIT INC.
ION EXCHANGE for Water Conditioning
Chemical Processing • Industrial Waste Treatment

Chemical Week

December 14, 1957



Despite New York's wintry weather, 26th Chemshow drew record crowd of 35,000 to Coliseum.

Under the Big Top at Last Week's Chemshow

This week is no breathing spell for the 550 companies that had exhibits at the 26th Exposition of Chemical Industries, which closed on Friday of last week.

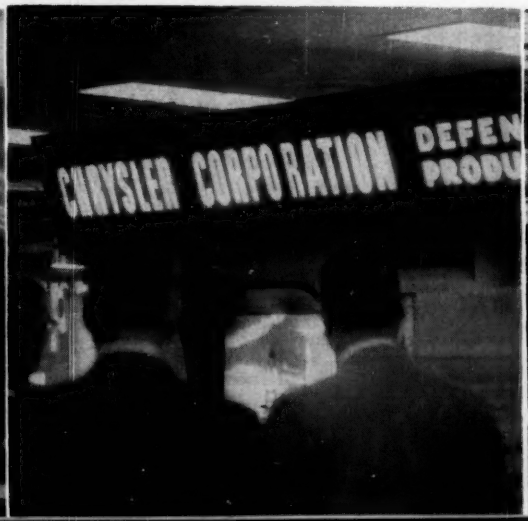
A barrage of technical data and battalions of salesmen are going out in response to a record number of inquiries and requests—35,000 industry people, an all-time high in attendance, took in the 669 exhibits blanketing four floors of the New York Coliseum.

Skunks and a Cockatoo: With this year's exposition reaching record proportions in all measurable respects, there was keen competition among exhibitors to catch and hold visitors' interest. Attention-getters included live skunks, a white cockatoo, a fleet of model electric trains, among other things (*see photos below*).

One of the most successful in this respect was Chrysler Corp.'s missiles motion picture, which continuously drew knots of standees. And there was the accustomed sprinkling of attractive girls to demonstrate equipment and materials.

But for serious-minded buyers, what counted the most was the week-long opportunity to take a close look at new equipment—ranging from a but-

Strategies included close inspection, movies on missiles, demonstration with charm.



ton-size rechargeable electric battery (weighing 1½ oz.) all the way up to a 12-ton contactor for solvent extraction and blending.

More than 450 visitors from other nations were among the management men, engineers and scientists trooping into the Coliseum last week. Going into the final afternoon of the show, Canada was far out in the lead in number of visitors, with nearly 200. Spain was represented by 79, United Kingdom by 20, West Germany by 19, Japan by 18 and Italy by 15. There were 14 shoppers from France, 11 from Argentina, nine from Cuba and eight from Venezuela. No visitors from any of the Communist nations were registered.

The total estimated attendance as of closing day stood at 35,000, about 60% more than the 21,900 actual attendance at the previous Chemshow, held in Philadelphia in 1955. This year's show included nearly 2.8 million lbs. of equipment and materials—about 1 million lbs. more than the combined weight of objects appearing in any previous Coliseum exhibition.

Evening Events: Chemshow visitors to New York last week partook of a varied calendar of professional events. Scheduled: the 14th Chemical Engineering Achievement Award dinner; the Chemical Exposition dinner of the American Chemical Society's New York section; and the annual meetings of the American Society of Mechanical Engineers and the American Rocket Society.

Highlight of the week's extracurricular activities was the Chemical Engineering Award dinner, at which 78 organizations were honored for their contributions to the extractive metallurgy of atomic-age metals. Principal speaker: metallurgical engineer Zay Jeffries. Jeffries said that "our main hope of avoiding a suicidal atomic war is the first law of animate nature—self-preservation." He called on the engineering profession to take the lead in meeting the challenge of attaining "nothing less than freedom with abundance."

Looking Ahead: Almost before the week ended, Earl Stevens—president of International Exposition Co. (New York), which promotes the Chemshow—began preparations for exposition No. 27—set for the New York Coliseum during the week of Nov. 30-Dec. 4, 1959.

Atom Blast Rebuttal

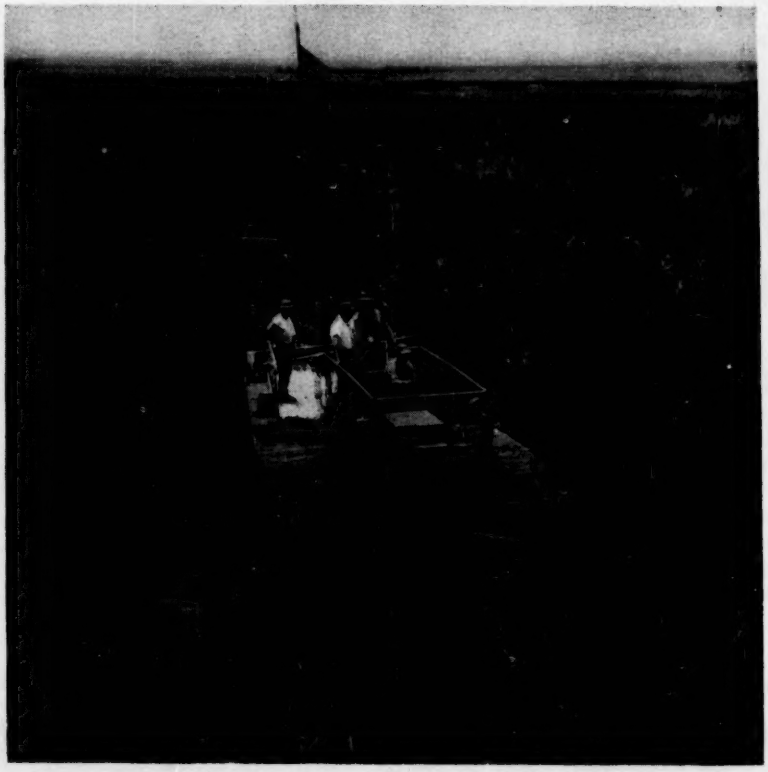
The Windscale reactor incident (CW, Oct. 26, p. 21) is still yielding lessons to U.S. nuclear industry men intent on learning from Britain's experience.

In the wake of the explosion that scattered radioactive iodine over 200 sq. miles of English countryside comes a new blast from Windscale scientists who charge that the government's account of the accident contains "monstrous inaccuracies" and that scientists have been "pilloried as scapegoats."

It's also charged that the physicist blamed for the accident wasn't even on the scene when it happened, and that the Atomic Energy Authority has refused to make available its official report—in the unabridged version.

The charges are part of documentary evidence scientists will give to the independent Fleck Committee, which, in turn, will report to the government on a wide range of issues arising out of the reactor accident.

Late last month, a deputy of AEA Chairman Edwin Plowden refused to comment on the charges. But, later, AEA officials said they would comment as soon as the Fleck Committee files its evidence, perhaps this month.



Staking Interstate Ethylene Hookup

Using marsh buggy and pontoon sled, this survey crew is staking out the final leg of a 30-mile pipeline to carry 99.5%-plus ethylene from Lake Charles, La., to Orange, Tex. It will reportedly be the first interstate pipeline for delivery of a high-purity chemical. Now nearing completion, the 6⅝-in. O.D. line will link Petroleum Chemicals' 200-million-lbs./year Lake Charles ethylene plant (also nearing completion) with two Texas contract customers: Du Pont and Spencer Chemical. Ethylene will go into the specially coated pipe at 1,000 psi. and be withdrawn at 450 psi., enabling the line to be used for storage to assure deliveries during any short shutdown.

Distillers Takes Over

For operational and managerial advantages as well as for tax benefits, National Distillers & Chemical Corp. (New York) is acquiring Panhandle Eastern Pipe Line Co.'s 40% interest in National Petrochemicals, Inc.

This makes National Petrochemicals a wholly owned subsidiary under National Distillers' U.S. Industrial Chemical Co. division. Plans call for National Petrochemicals to become a separate division of Distillers, however, shortly after the purchase is consummated—probably this month.

Panhandle Eastern will receive 1.5 million shares of Distillers stock—current market value about $31.7 million—in exchange for Panhandle's holding of National Petrochemicals stock. Distillers and Panhandle organized Petrochemicals in '53 as a 60-40 joint venture with a plant at Tuscola, Ill.

National Distillers' Executive Vice-President Robert Hulse told *CW* this move—in the works for months—has three specific advantages:

- Simpler and more direct administration under one management.
- Elimination of any present or potential conflicts of interest between National Petrochemicals and USI.
- Elimination of "double taxation" on National Petrochemicals' profits, in that they will no longer be taxed as dividends.

Property Tax Peril

In Baltimore and Baton Rouge last week, process industry management showed its increasing concern about the trend toward higher tax rates by state and local government.

At Baltimore, two fertilizer makers said they are being forced to curtail operations because of the city's 1956 ordinance adding manufacturers' inventories and equipment to the property tax rolls.* Baugh Chemical Co. and Fertilizer Manufacture Cooperative, Inc., declared that Baltimore's fertilizer and chemical industry would be "doomed" unless the tax law is changed.

At Baton Rouge, President J. Peter Grace, of W. R. Grace & Co., stated that future expansion of the company's new $20-million polyethylene plant would be governed by Louisiana's tax structure. He said he hoped the next expansion move would come within five years, but that any expansion program would be related to the tax situation.

*Another Baltimore tax, on advertising, also vexes chemical companies *(see p. 69)*.

Kudos at Cleveland

President Eisenhower's appeal for support of his foreign relations policy is being taken to heart by the chemical industry. This was clearly indicated at last week's annual awards dinner of the Chemical Profession of Cleveland.

The principal speaker, MCA President John Hull, did not mention the President's bid for backing on extension of the reciprocal trade act and U.S. participation in Organization of Trade Cooperation. But he emphatically did endorse the Administration's plea for the mutual aid program—relayed by Secretary of Labor James Mitchell at the recent winter meeting of the Manufacturing Chemists' Assn. (*CW, Dec. 7, p. 32*).

Further, General Hull spoke up strongly for three other proposals of the Eisenhower Administration: enhanced science education programs in U.S. schools and colleges; increased amounts of basic research work in industry and elsewhere; and international cooperation in the field of science.

Honored for "contributions to the enhancement and interpretation of the chemical profession":

- Raymond Dinsmore, vice-president for research and development, Goodyear, for contributions in tire manufacture and plastics.
- Thomas Mastin, vice-president for research and development, Lubrizol Corp., for work in chemistry of protective coatings, polymers, lubricants.
- Robert Savage, vice-president for research, North American Coal Corp. and former faculty member at Case Institute of Technology, for contributions as a teacher in the chemical profession.
- Glenn McIntyre, chairman and general manager, National Spectographic Laboratories, for work in porcelain enamel glasses and castings for metals.
- Wilfred Stoll, production quality engineer, National Carbon Co. division, Union Carbide Corp., for contributions as chairman of the Electrochemical Society's national convention in Cleveland last year.

CAPITAL SPENDING

IN PHILADELPHIA AREA

(millions of dollars)

Industry	1957 actual	1958 planned
Chemicals and allied products	$71.2	$56.6
Petroleum and coal products	74.8	82.4
Paper and pulp	14.8	14.9
Rubber	9.1	5.6
Stone, clay and glass products	10.5	10.4
Primary metals	51.7	55.6
Process industry totals	232.1	225.5
All manufacturing industries	391.2	338.8

From survey by Federal Reserve Bank of Philadelphia

New Reading on '58 Dip

Another indication that capital spending will dip next year to about the 1956 level comes from a survey released last week by the Federal Reserve Bank of Philadelphia.

The study covers manufacturing industries in the tri-state area around Philadelphia and the Lehigh Valley in Pennsylvania, Trenton, N.J., and Wilmington, Del.

The regional Federal Reserve data (soon to be eclipsed by the U.S. Dept. of Commerce's nationwide survey) emphasizes a point made in the latest McGraw-Hill report on capital spending (*CW, Nov. 9, p. 24*): the coming cutback in process industries' expansion plans is considerably more modest than the anticipated drop in capital spending by most other industries.

In the Philadelphia area, chemical process companies expect their capital spending to be only 2.8% less than this year's high-water mark (*table, above*). Projected capital spending in 1958 by all manufacturing industries in the same area is 13.3% below the current year's level.

By contrast, however, chemical process industries in that region were surpassed by most other industries in fulfilling this year's expansion plans. The CPI's capital spending in '57 was 10.5% less than anticipated, while the all-manufacturing total for '57 was 2.6% higher.

COMPANIES

Sun Chemical Corp. stockholders have approved purchase of Ansbacher-Siegle Corp., organic pigment manufacturer.

•

Three cement makers, Hercules (Philadelphia), Peerless (Detroit) and Riverside (Los Angeles), have won stockholders' approval to merge (probably by Dec. 31). The new company, American Cement Corp., would rank among the top six in the U.S. Hercules shareholders would get 1.145 American Cement shares for each share of Hercules they now hold. Riverside shareholders would get a 2-for-1 exchange; and Peerless stockholders a 1.268-for-1 exchange.

•

The Carborundum Co. will combine its Stupakoff, Globar, and Refractories divisions into the new Refractories Division, which will be based at Niagara Falls, N.Y.

•

Eastman Kodak Co. will declare an estimated $38.2-million wage dividend, highest in the firm's history. Over 50,000 employees will get $32 for each $1,000 they earned in the past five years.

•

Abbott Laboratories common-stock holders will get an extra 10¢ dividend with their regular 45¢/share quarterly payment.

•

Merck & Co. will pay an extra 20¢ with current 30¢/share dividends. This year's previous quarterly payments were the regular 25¢/share.

FOREIGN

Soda Ash/Netherlands: Dutch Soda Ash Co. Ltd. will start production this month at its $13.5-million soda ash plant near the port of Delfzijl. It was built with Diamond Alkali Co. technical help.

•

Teflon/Germany: Farbwerke Hoechst plans to expand its Teflon plastic production. It has a Du Pont license, has been producing both Teflon and polytrifluorochloroethylene—a similar plastic—for a number of years.

•

Expansion/Hungary: Add to the giant Tisza chemical combine (*CW, Sept. 14, p. 26*) these Hungarian expansion plans:

A 2,024-lbs./day polyethylene plant, onstream this month, kicks off the 1958-60 three-year plan. Hungaria Chemical Works will supply basic material to the viscose works for perlon-type fiber production, slated for 331 tons/year after the summer of '58. Cellophane production will be stepped up from 260 to 331 tons/year. Annual requirements are 552 tons.

Construction of a 5,000-tons/year synthetic dye works will begin next month in Budapest, is slated for completion in two years. The government expects the new plant's output to fill needs now met by imports, with some left over for exporting.

•

Carbide/Germany: Farbwerke Hoechst has begun building a second 40,000-kw. furnace at its Knapsack plant near Cologne. The 300-tons/day furnace will cost an estimated $2.4 million, will help produce acrylonitrile for Farbenfabriken Bayer's Draylon fiber. Knapsack's present carbide capacity is 360,000 tons.

•

Plastics/Hong Kong: American Petrochemical Corp. has licensed National Lacquer and Paint Products Co. Ltd. (Hong Kong) to manufacture polyurethanes, alkyd resins and polyesters for Southeast Asian distribution.

•

Nuclear Fuels/France: St. Gobain has teamed up with Forges et Ateliers du Creusot, a metallurgical and construction firm, to form a $600,000 nuclear fuel research and development company, Centre des Recherches pour Combustibles Atomiques (CERCA). It will work closely with the French Atomic Energy Commission. St. Gobain holds interest in three other atomic energy groups.

•

Catalysts/Netherlands: American Cyanamid and Koninklijke Zwavelzuurfabrieken v/h Ketjen N. V. (Amsterdam) will form a Dutch company to manufacture platinum reforming catalysts for the oil industry. Each will contribute an initial $1.2 million for an Amsterdam plant, due onstream by the end of '58.

EXPANSION

Uranium: Lakeview Mining Co. will build a $2.6-million, 210-tons/day uranium mill at Lakeview, Ore., where it already operates two mines. The firm holds an AEC contract, expects to complete construction in a year.

Vitro Minerals Corp. and the Atlas Corp., meanwhile, have put before AEC a joint proposal to operate a 1,000-tons/day uranium mill in Wyoming's Gas Hills mining area.

•

Zirconium: Firth Sterling Inc. will double its zirconium melting capacity by Jan. 1. The company has just received a $1.5-million, one-year Westinghouse contract for finished zirconium alloy mill products. It will melt ingots from sponge and produce up to 40,000 lbs./month of mill products, primarily for structural parts and fuel element cladding in reactor cores at Westinghouse's Bettis division.

•

Solvents: Shell Oil Co. of Canada, Ltd., is calling for construction bids on a $600,000 solvent plant at its Shellburn refinery. The plant, British Columbia's first, should go onstream early this summer.

From "Dutch Boy" research ... a gellant that prevents hard settling in a broad range of finishes

In any paint, pigment particles tend to migrate.

As they separate, settle, float, or agglomerate, paint performance goes down. Hues change. Streaking appears. Hiding is lowered. Hard cake forms.

National Lead research has developed agents that lock errant pigments in place. One of the latest is DUTCH BOY BENTONE® **38** gellant, unique in the wide range of solvents it gels... and hence in the paints it improves. It is a highly efficient thixotropic gelling agent.

In almost any paint from oil-based exteriors to epoxy resin finishes, BENTONE **38** gellant prevents hard settling. It also aids color; boosts hiding; steps up body; stops sag; increases sprayability, hold-out, temperature independence.

Other "Dutch Boy" developments meet special compounding needs

There is DUTCH BOY BENTONE **34** gellant, for example. It improves paints, cosmetics, coatings and other compounds made with low polarity solvents. DUTCH BOY BENTONE **18-C** gellant does as much for such high polarity items as vinyl anti-fouling paint. DUTCH BOY BEN-A-GEL® gellant takes over in water-based compounds.

National Lead research is improving vinyl compounds, too. With seventeen DUTCH BOY stabilizers... each a specific for conditions affecting life and quality in vinyl film, sheeting, insulation and other stocks.

The coupon will bring you details on the "Dutch Boy" chemicals mentioned. For technical assistance in their application, write.

NATIONAL LEAD COMPANY KC-8500
111 Broadway, New York 6, N. Y.
In Canada: **Canadian Titanium Pigments Limited**
630 Dorchester Street, West, Montreal

Gentlemen: Please send literature checked below:

Folders on "Dutch Boy" Gelling Agents:
- ☐ "DUTCH BOY" BENTONES (gel organic liquids)
- ☐ "DUTCH BOY" BEN-A-GEL (gels aqueous compounds)

Folders on "Dutch Boy" Vinyl Stabilizers:
- ☐ (Specify type of vinyl products you make)

*Name*_____ *Title*_____
*Firm*_____
*Address*_____
*City*_____ *State*_____

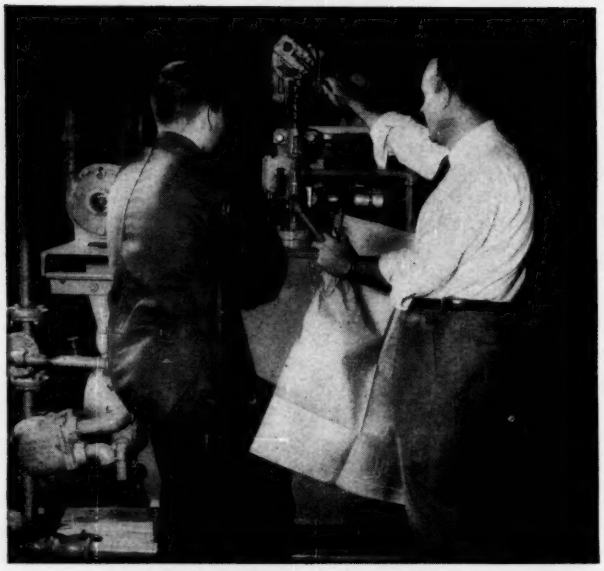
Buy **Dutch Boy® CHEMICALS**

... and get the plus of a name you know ... for quality

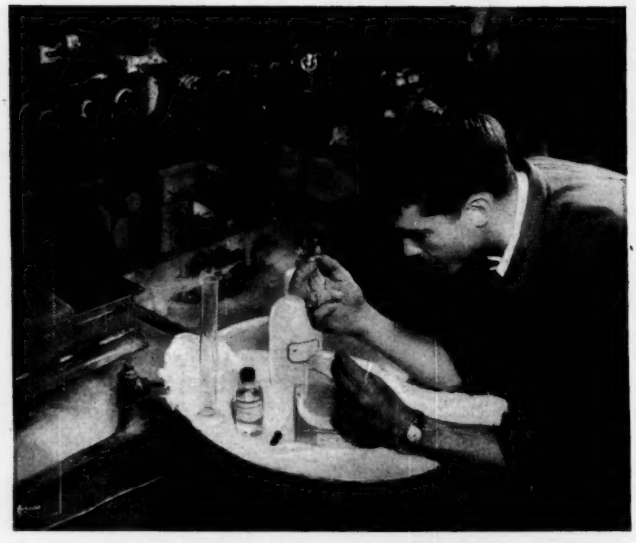
HERCULES SERVICE...

YOUR BONUS

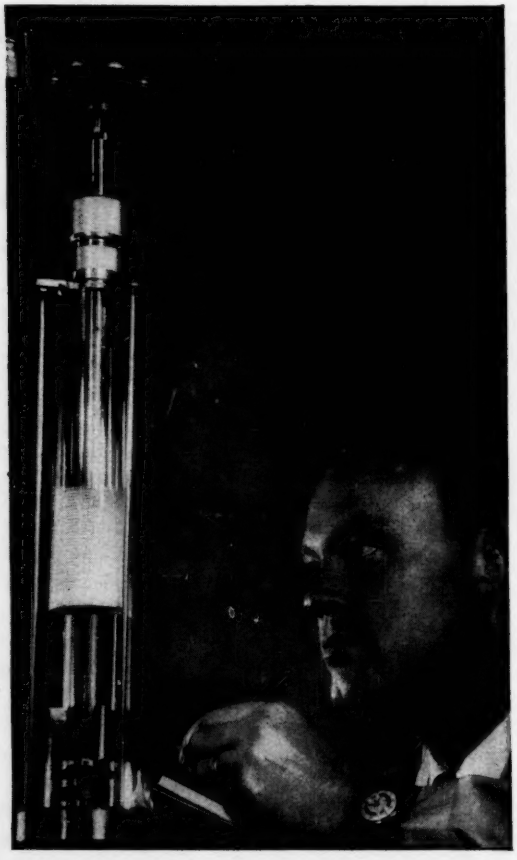
The man from Hercules is never just an "order taker." He's a Technical Representative, thoroughly trained in the science of papermaking. Supplying quality products from unlimited distribution facilities, Hercules adds another all-important bonus—TECHNICAL SERVICE.



NEW MILL OR NEW EQUIPMENT—Even before a mill is in operation the Hercules technical representative gives engineering assistance in the design of chemical handling systems. Here a Hercules man helps with the installation of an automatic emulsifier—an exclusive Hercules development.



ON STREAM—When a mill is in operation the Hercules man is always on tap to assist in finding the solution to any technical problem and to recommend the right material to meet your specific requirements.



BEHIND THE SCENES—Hercules maintains technical service laboratories at its numerous plants as well as its research center in Wilmington, Delaware. All of these facilities are at your command for assistance in solving unusual problems.

HERCULES

Paper Makers Chemical Department

HERCULES POWDER COMPANY

INCORPORATED

900 Market Street, Wilmington 99, Delaware

PP57-6

Washington
Newsletter

CHEMICAL WEEK
December 14, 1957

The earth satellite drama points up a communications failure —the U.S. has missed valuable Russian technical information because of failure to translate Russian technical journals.

The fact is that we are making only partial use of the considerable volume of Russian technology that's available to us. Translations are made in the U.S. of about 40 Russian scientific and technical journals. But some 200 Red publications could be translated on a regular basis.

The Russians do a better job on U.S. technical journals. They regularly translate about 1,400 of the 1,800 scientific journals published in this country. In addition, the Soviets publish abstracts of about 10,000 journals published in other countries.

The Russians also have an "express information" system, which abstracts key articles for top scientists before complete issues of a journal are translated and distributed. Many Russian scientists read U.S. scientific journals as early as our own scientists do.

Our problem: there is no central direction of translation and distribution of Russian journals. There is no central list of sources of Soviet translations in the U.S., let alone a catalog of translated material.

Congress is taking an interest in this problem. Top scientists will be called by the House Government Information Subcommittee, headed by Rep. John E. Moss (D., Calif.), early next year. The idea is to find out what the scientists want and can best use, and then consider best ways of meeting their requirements.

Government agencies are after more money to enlarge their translation programs. The National Science Foundation wants to establish a central clearing house for all such translated information, increase its program from $300,000 to $500,000/year. Commerce Dept. has authority from Congress dating back to 1950 for such a clearing house, but has never been given money for more than a token operation. Military agencies already in the translating business will be after more funds, too.

Whether a sensible, comprehensive program can be created remains to be seen. For one thing, the military and intelligence agencies want to classify most of their translations. They can't make a case that they're keeping this information from Russian scientists. Instead, they say that it benefits the Soviets to know what areas of technology interests the U.S.; hence, it's worth the effort to keep them from knowing which of their journals and articles are being translated and distributed in this country. Obviously, the Russians avoid this problem; they translate practically everything the U.S. publishes.

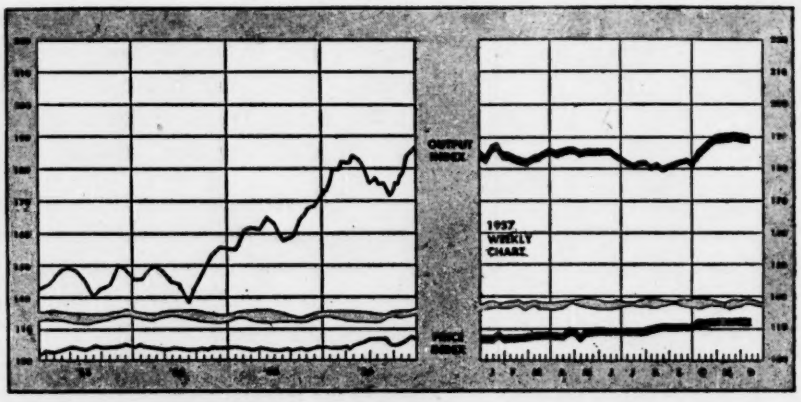
Washington Newsletter

(Continued)

Progress is being made on machine translation of Russian. A Georgetown University (Washington, D.C.) group is setting up a code to be used with an IBM computer. Large-scale translation is still in the remote future; but early next year, the group is planning a test run on a 30-page Russian paper relating to experiments in organic chemistry. Eventually, a machine should be able to translate 30,000 words in 4 to 5 hours—a week's work for a human translator.

If you're interested in available sources of Russian material, here's a list to keep:

- National Science Foundation, Washington 25, D.C.—ask for list of contractors doing Russian translations.
- Special Libraries Assn. Translation Center, 86 Randolph St., Chicago 1, Ill.
- Library of Congress, Washington 25, D.C.—publishes monthly list of Russian accessions.
- Atomic Energy Commission, Washington 25, D.C.—publishes abstracts in the atomic field.
- Armed Services Technical Information Agency, Dept. of Commerce, Washington 25, D.C.
- National Institutes of Health, Washington 25, D.C.
- Office of Technical Services, Dept. of Commerce, Washington 25, D.C.
- United Kingdom Scientific Mission, 1907 K St., N.W. Washington, D.C.—lists British translations of Russian journals.

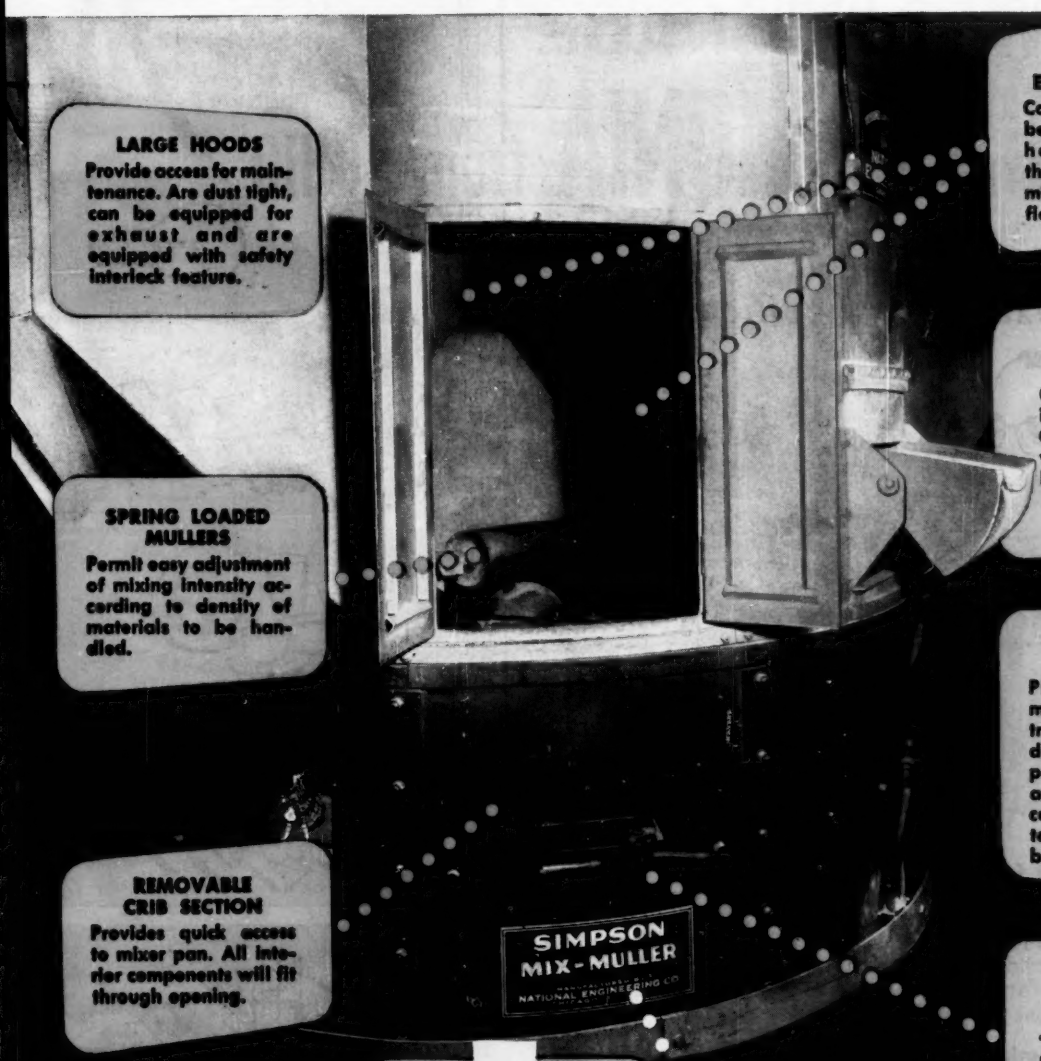


Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	185.0	188.0	186.2
Chemical Week wholesale price index (1947=100)	111.1	111.2	107.2
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	40.8	40.17	44.30

MONTHLY	Exports			Imports		
Foreign Trade (million dollars)	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
Chemicals, total	105.4	118.9	108.8	20.9	22.6	18.7
Coal-tar products	6.2	7.8	7.8	3.8	4.7	3.8
Industrial chemicals	18.3	18.7	19.1	6.4	6.6	6.3

Why Engineers prefer Simpson *MIX-MULLER*®



LARGE HOODS
Provide access for maintenance. Are dust tight, can be equipped for exhaust and are equipped with safety interlock feature.

HOOD CAN ENCLOSE HOPPERS
Components of mix can be held ready in batch hoppers. You get the quality of a batch mix, on a continuous-flow basis.

ADDITIONS HOPPER
Can be air or mechanically operated.
Can be located anywhere on periphery of hood.

SPRING LOADED MULLERS
Permit easy adjustment of mixing intensity according to density of materials to be handled.

TIME MASTER® CONTROLS
Provide push button mixing operation. Control of mixer charge, discharge, batch hoppers, water and other additions as well as control of material flow to and from mixer, can be automatic.

REMOVABLE CRIB SECTION
Provides quick access to mixer pan. All interior components will fit through opening.

MATERIAL SAMPLER
—is safe, positive and externally mounted at position of users choice.

BOTTOM DISCHARGE
Plows clear pan quickly, thoroughly—automatically through bottom door. Discharge to belt, elevator, hopper screen, etc., is easily arranged.

THE SERVICES OF NATIONAL

. . . Engineering Company stand behind every Simpson Mix-Muller produced. By taking advantage of these services you get the benefit of 40 years of practical experience in the integration of mixing equipment. Complete design and engineering facilities for materials handling equipment, raw materials storage, etc., are included in the National service. This single responsibility through design, manufacture and installation will assure you of top mixing performance . . . from a properly integrated mixing plant.

Write for the new bulletin on mulling.

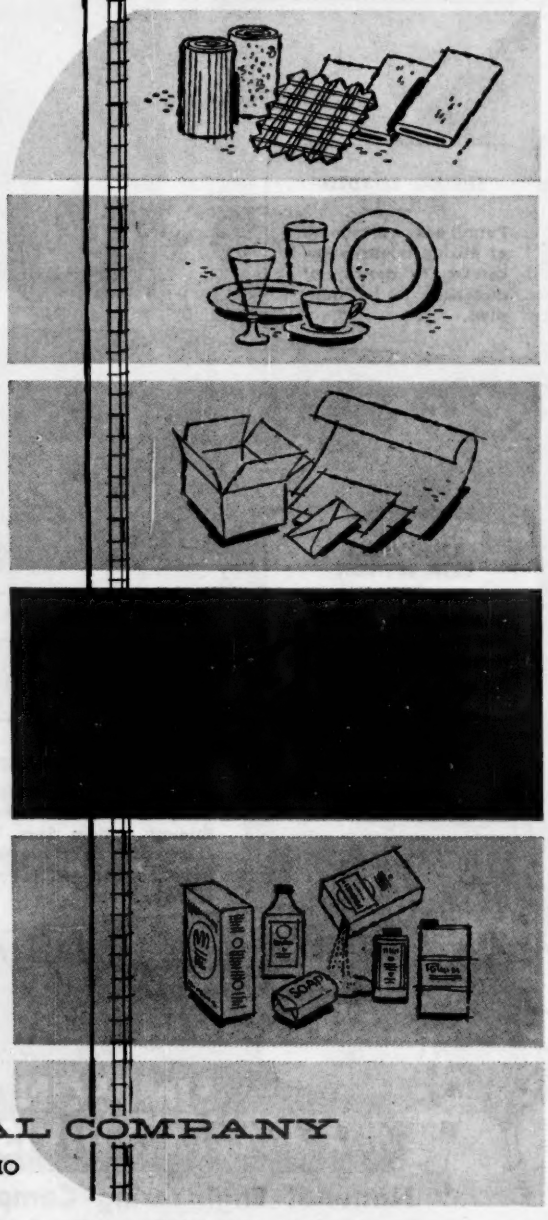
SIMPSON MIX-MULLER® DIVISION

National Engineering Company
642 Machinery Hall Building • Chicago, Illinois

C576

NEW HIGH-GRADE AQUA AMMONIA from SOHIO

to meet your most exacting specifications



New plant facilities — Pure condensate . . . filtered product . . . automatic control of concentration with new "densitrol" . . . and quality tests before loading. Combine this formula for superior grade aqua ammonia with dependable, fast service and you'll see why it pays to call Sohio first for your aqua.

- **Specifications** — Made more rigid than ever. Call the man from Sohio and discuss with him your own specification requirements.
- **Service** — Sohio's new production and storage facilities provide aqua ammonia "on the shelf" for prompt shipment. Aluminum tank cars and trucks are used only for aqua. Cars unload top or bottom . . . trucks are self-power unloading . . . to match your storage.

When you need highest quality aqua ammonia and fast service, call the man from Sohio.

. . . we're serious about SERVICE at Sohio

SOHIO

SOHIO CHEMICAL COMPANY

FT. AMANDA RD., P. O. BOX 628, LIMA, OHIO

Royal Jelly: Selling the Queen Bee's Secret

This week Macy's department store in New York City—the world's largest drug and cosmetic center—added two new items, an eye cream and moisture drops, to its growing list of products that contain "royal jelly," a complex organic compound secreted by bees to nourish the egg of a future queen bee.

And in recent weeks, Helena Rubinstein has disclosed that she too was willing to share with U.S. women the secret of the queen bee's long life. Her Beauty for Life capsules are the company's first product containing royal jelly.

If Madame Rubinstein, a famed innovator in the cosmetic industry, seems to start slow in this race for the women's cosmetic dollar, she has this consolation —the French houses have a lap on almost all the U.S. cosmetic makers. Although royal jelly has been a top promotional gimmick in France since 1953, it is only now being exploited in the U.S.

The biggest thing to hit the cosmetic industry since lanolin, at least in sales appeal, royal jelly probably owes its public acceptance to the same thing that helped lanolin. Like lanolin and chlorophyll, royal jelly is a "natural" product rather than a "chemical," something that women—if the motivation researchers are right—have a tendency to mistrust.

Rejuvenation—$15: First to recognize the tremendous promotional potential of royal jelly in the U.S. were Lilly Dache, president of General Beauty Products, and Richard Salomon, president of Charles of the Ritz. Both their companies had jelly-containing items on the market in '54—Salomon offered Elixir de Markoff, retailing for $15/1½ oz.; Miss Dache suggested Marie Earle Queen Bee Cream at $15/oz.

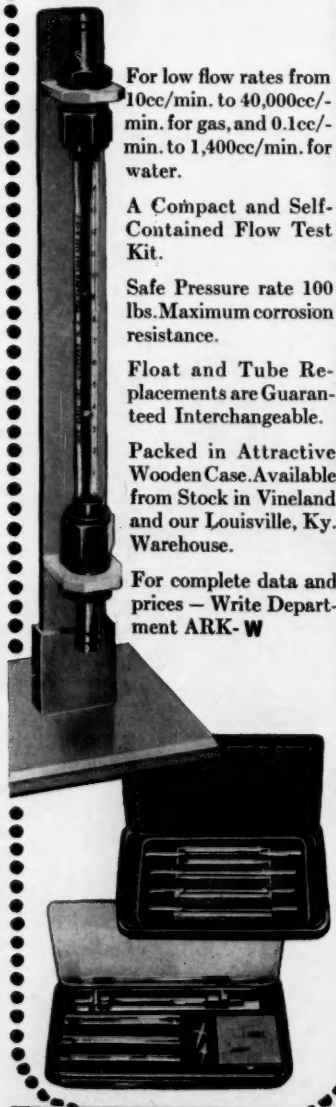
Though first in the field, these two firms are not the biggest users of royal jelly. That distinction probably belongs to Frances Denney, a Philadelphia cosmetic house, which distributes through prestige department stores. It's currently producing some nine royal jelly-containing products, ranging from a lipstick ($5.55) to an eye cream ($15).

Other large users of royal jelly are the Richard Hudnut Division, Warner-Lambert Pharmaceutical Co., which offers Du Barry Royal Nectar for women "who want to recapture that breathlessly young look"—and can afford $5 for 2 oz. of lotion. The company also has a fluid makeup and a cream.

Harriet Hubbard Ayer offers a moisture balm (about $5), Lestrona (New York) has a cream (1¼ oz. for $3.95) and Macy's has several of its own brand products in the lower-price range. Big sellers from France are Germaine Monteil's Super-Royal Fluid Makeup (1 oz., $7.50) and Orlane's Creme de la Gelee Royale (1 oz., $10). On the West Coast, Colonial Dames (Montebello,

Royal Jelly Products: Helping hand from nature.

ACE
Lo-Flow
ROTA-
KIT©



For low flow rates from 10cc/min. to 40,000cc/-min. for gas, and 0.1cc/-min. to 1,400cc/min. for water.

A Compact and Self-Contained Flow Test Kit.

Safe Pressure rate 100 lbs. Maximum corrosion resistance.

Float and Tube Replacements are Guaranteed Interchangeable.

Packed in Attractive Wooden Case. Available from Stock in Vineland and our Louisville, Ky. Warehouse.

For complete data and prices — Write Department ARK-W

ACE GLASS INCORPORATED
VINELAND ♠ NEW JERSEY
Midwestern Division
LOUISVILLE, KY.—Box 996
Specialists to Industry and Research

Calif.) is marketing three items: a vitamin capsule ($8.50 for 60), a cream ($5 for ⅞ oz.) and a cosmetic fluid ($3.50 for 2 oz.).

The list of users is almost certain to expand. Not yet in the royal jelly picture, but reportedly readying products are two of the bigger door-to-door retailers, Avon Products and Beauty Counselors. Revlon has surprised many by not getting out a royal jelly product.

Nonfading Fad: The success of royal jelly apparently caught U.S. cosmetic makers somewhat by surprise. The reaction of Donald H. Powers, research director of Hudnut, is typical. He told *CW*, "We thought all the fuss about queen bees would be over by now. These exotic ideas come over all the time from France, and they create a brief flurry in the higher-priced cosmetic lines. That's usually the end of it. But queen bee products seem to be still building up interest. More and more products at all price levels are adding to the amount that's written and said about it."

Explaining his company's entry into the field. Powers said, "Our Royal Treatment Cream was introduced in the spring, and it's already a best-seller in the Du Barry line. We developed it originally as an excellent night cream. The sales department wasn't interested in it, however, felt that it lacked sales appeal—without royal jelly that is."

Unbelievers: Many companies interested in using royal jelly in cosmetics are meeting strong resistance from their own technical staffs. *CW* polled leading cosmetic chemists, learned that almost all dismissed royal jelly as a useful cosmetic ingredient. A typical response was that of the technical director of one of the country's biggest cosmetic houses. He told *CW*: "We don't use royal jelly in any of our products. I think it's a complete phony. As you know, royal jelly is a very complex organic secretion by the nurse bees, and it is used to fill the cells in which the queen bee's egg is nourished. Undoubtedly it's very good for queen bees. But as far as human beings are concerned, nobody has proved that it has any benefits.

"Most of the literature that's been forthcoming has been from beekeepers who are eager to sell the stuff. I've read much of the available literature on it, but there was nothing in any of it that convinced me that royal jelly does people any good. I don't know exactly what's in it because I didn't do an analysis, and I'm not familiar with the people who did analyze it. Since I wasn't convinced by their reports, we didn't look into it any further."

Hal Goulden, scientific director of the Toilet Goods Assn., took this stand: "It's wonderful—for bees. There's no evidence that it has any cosmetic value for human beings or that it's worth serious consideration." TGA has seen enough interest evidenced by its members to warrent the association's preparing copies of its correspondence with a leading authority on bees, Professor E. Dyce, of Cornell University's College of Agriculture. An entomologist, Professor Dyce has studied the relationship of royal jelly to the longevity and fertility of queen bees.

He explained to *CW*, "We haven't done anything on the application of royal jelly to humans. All of our work has been basic research. Most recently we studied the keeping qualities of royal jelly treated in various ways, and Maurice Vernon Smith (a researcher presently at Ontario Agricultural College) reported the results in his doctoral thesis. It was pure research but had no application, so far as we could see, to creams or to miracle cures for people."

A similar attitude was forthcoming from Tage S. K. Johansson, of New York's Queens College. Johansson, who has published the only comprehensive review of scientific literature on royal jelly told *CW*, "Royal jelly's good food for bees, but otherwise there's nothing special about it. Sure, it's high in protein and other nutrients, but people can get the same thing in much cheaper ways.

"Just because royal jelly extends the life span of insects, it's silly to conclude it will do the same thing for humans. Insect physiology is entirely different. Of course, every once in a while a physician reports some tremendous success in treating patients with royal jelly—but none of these miracle cures has happened under conditions that can be verified."

Government-Backed Bees: The medical cases Johansson alluded to come mostly from abroad—especially from France and Italy, where medical research has been encouraged by government bureaus interested in bee

Missiles designed to soar out of this world

...are sped by liquid oxygen from LINDE

Oil, kerosene, and alcohol "burn" by combining chemically with oxygen from the air. But it takes pure oxygen with these fuels to speed rocket planes faster than sound . . . to drive missiles beyond the earth's atmosphere.

Liquid oxygen, vital to today's rocket engines and many types of missiles, was being produced by LINDE as long as 25 years ago. In fact, LINDE has been supplying oxygen to industry for more than 50 years. LINDE pipes oxygen directly to industrial users from nearby oxygen plants built and operated by LINDE. The user makes no capital investment, and pays only for the oxygen consumed —at a price guaranteed by LINDE.

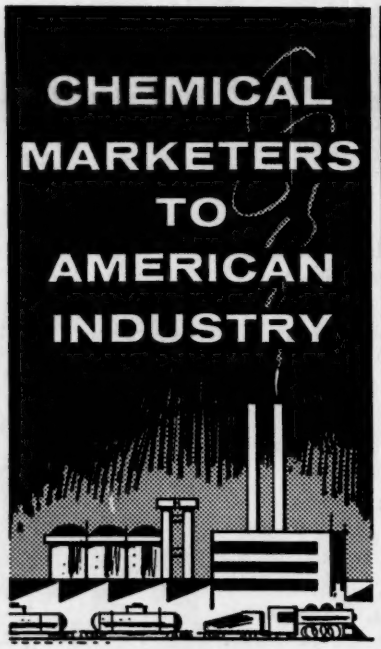
LINDE also developed methods for transporting liquid oxygen efficiently, in large and small amounts, at 300 degrees below zero F. You can get LINDE oxygen in just the quantity you need, at the exact time and place you want it, as a liquid or a gas.

For detailed information about LINDE oxygen, write Dept. L-14, LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

When you need Oxygen—call LINDE!

The terms "Linde," "Driox," and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

OXYGEN
Liquid oxygen from LINDE's DRIOX oxygen units is teamed with liquid fuels to propel missiles and rocket planes.
Linde
TRADE-MARK
UNION CARBIDE



Modern grinding techniques have accelerated the increased consumption of non-metallic minerals throughout present consuming industries and have further created a broad new vista of industrial application.

Berkshire Chemicals, Inc., keeping pace with this development, is privileged to offer selected non-metallic minerals in this category. We invite your inquiries.

*MISTRONS
(HYDROUS MAGNESIUM SILICATES)
SILICA (HARD AND SOFT)
DIATOMACEOUS EARTH
BENTONITE

INDUSTRIAL CHEMICALS
METALLIC AND NON-METALLIC MINERALS
AGRICULTURAL CHEMICALS

*Trade Mark Sierra Talc & Clay Co.

Berkshire Chemicals
INC.
420 LEXINGTON AVE., NEW YORK 17, N.Y.
BOSTON • CHICAGO • CLEVELAND
PHILADELPHIA • SAN FRANCISCO

culture. Clinical studies in these countries have produced colorful claims that royal jelly regenerates cells, retards old age, gives relief in menopause, strengthens premature babies, etc. One study given wide publicity, ascribed Pope Pius XII's recovery after a prolonged illness to the therapeutic effects of royal jelly.

Unfrank Frenchmen: By U. S. standards, these "clinical" results have been obtained without sufficient statistical control. One research director said: "In France, for $500, you can get clinical studies on anything. They're of the testimonial type, sensational to read—but not science. I'll be convinced when I see well-controlled studies by reputable physicians who report all background data and who administer royal jelly on a scientific basis."

New Life for Beekeepers: While cosmetic chemists are, in the main, taking a "show me" attitude towards royal jelly, the beekeeping industry is going all out to promote the idea. And not without cause. Technological advances in cosmetic chemistry are quickly outmoding the use of beeswax in cosmetics; and royal jelly has helped the industry out of the doldrums.

Though accurate figures are hard to come by, it's estimated that total world consumption of royal jelly for commercial use has doubled from about 1,000 lbs. in '56 to 2,000 lbs. in '57. And apiculturists anticipate next year's demand to be around 5,000 lbs.—most of it slated for cosmetics, a small amount to be sold by health-food stores and mail-order medicine men.

The bulk is produced in the U. S., since this country accounts for most of the world's beekeeping. France and Italy are becoming important—as are Mexico and Latin America. Presently, the material sells for about $300/lb.

That $300 tag might seem to justify the sky-high prices charged for royal jelly products—but it doesn't. Cosmetic makers get tremendous mileage from the material. Estimated cost for the royal jelly used per ounce of cream is about 20¢. That's figuring on an addition of 150 milligrams of royal jelly per ounce of the cream (a typical use rate).

One of the persons most instrumental in promoting the use of royal

Royal Jelly Rationale

Comments chief chemist of a company now marketing royal jelly products.

"We're quite selective in our use of royal jelly. It must produce a queen bee. We started experiments on royal jelly about five years ago, and have had products incorporating it on the market for about three years. Of course, it was used some years before that in France, where some people claimed that it improved the texture of their skin, and others, who took it internally, said it gave them a feeling of pep and well-being."

Here are his replies to some direct questions.

Q: Did your experiments bear out these claims?

A: No. There is no scientific basis whatever for the claims. It's been widely tested in other laboratories; and so far, nobody's come up with conclusive evidence that people can benefit from using royal jelly.

Q: What did your company find in its laboratory tests?

A: We found that at least there was nothing harmful in royal jelly. We're convinced of that.

Q: But did you find anything beneficial?

A: Well, we know it's rich in vitamin B. And there's some sex factor there, but nobody's been able to isolate it. But I don't even know that this factor is beneficial.

Q: What effect does royal jelly have when applied to the skin?

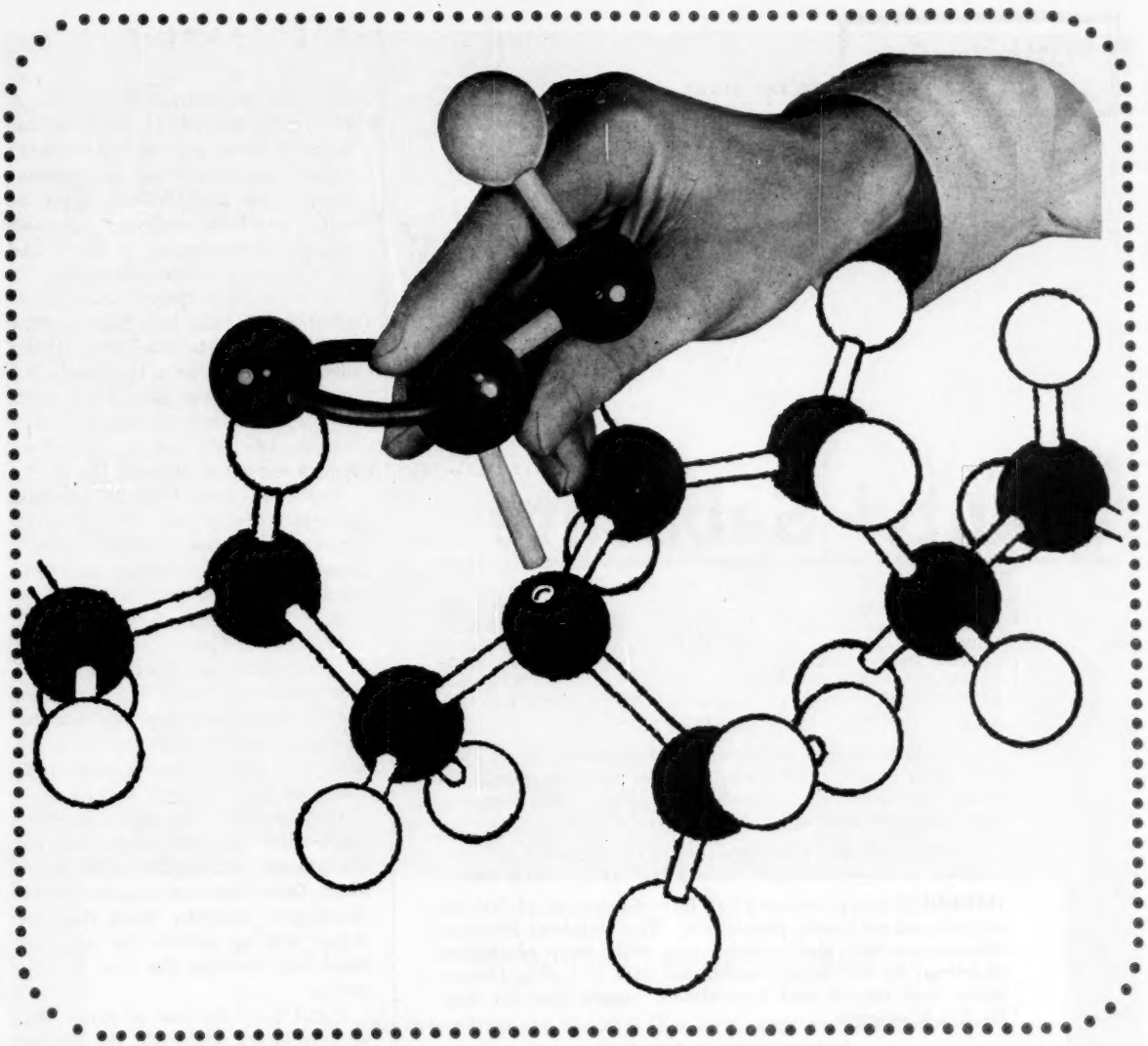
A: I don't know that is has any effect. There are some doctors who seem to feel that it improves the moisture content of the underlying tissues and that this might show up on the surface of the skin. But I don't know how true that is.

Q: On what evidence did your company decide to produce cosmetics containing royal jelly?

A: Mostly on the case histories from France—testimonials of people who had used it. There were also a few testimonials from people in this country.

Q: But there was no scientific basis for the decision?

A: None whatever—except, as I said, our lab tests showed it contained nothing harmful, and there existed the possibility that it might do some people some good.



For improved copolymers . . . add carboxyl groups by copolymerization with methacrylic acid

Rohm & Haas methacrylic acid offers a convenient and economical means of introducing carboxyl groups by copolymerization with monomers such as styrene, acrylonitrile, butadiene, acrylates and methacrylates. The addition of carboxyl groups, often in small proportions, may provide one or more of such advantages as:

- Improved adhesion
- Emulsion stability—both mechanical and freeze-thaw resistance
- Solubility in alkalies, including ammonia
- Reactive, cross-linkable groups which permit vulcanization with such agents as zinc oxide, diamines or epoxides.

Glacial methacrylic acid is readily available from full-scale commercial production. It is one of 18 acrylic monomers now available from Rohm & Haas. For full information on acrylic monomers write to Department SP.

Chemicals for Industry

ROHM & HAAS COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.

Representatives in principal foreign countries

Plasticizer Data
TO HELP YOU CHOOSE THE RIGHT PLASTICIZER

this Harflex® Plasticizer is non-toxic

Dibutyl Sebacate

FDA Accepted • Odorless • Tasteless • Excellent Low Temperature Characteristics

Appearance	Clear liquid
Color, APHA	25 max.
Odor	Neutral
Specific Gravity, 20/20°C	0.936 ± 0.003
Free acidity, as acetic acid	0.01% max.
Ester Content	99.0% min.

Other Uses

Vinyl chloride resins, copolymers and plastisols, safety glass and safety plastic interlayers, cellulose acetobutyrate, neoprene and acrylonitrile-butadiene copolymer low temperature formulations, rubber hydrochloride films.

Dicapryl Phthalate–least expensive of the phthalate plasticizers–is FDA accepted for foods of high water content only.

HARCHEM also produces a full line of sebacate, phthalate, adipate and polymeric plasticizers. The Harchem Division laboratories will gladly assist you with your plasticizer problems, or will supply additional data including formulation test results and formulation suggestions for any Harflex Plasticizer.

Address inquiries to Dept. H-39.

THE KEY TO HARCHEM® BETTER PLASTICS

HARCHEM DIVISION
WALLACE & TIERNAN, INC.
25 MAIN STREET, BELLEVILLE 9, NEW JERSEY
IN CANADA: W. C. HARDESTY CO. OF CANADA, LTD., TORONTO

TRICHLOROMELAMINE

(89% available chlorine min.)

An effective yet stable germicide

- Highest stable chlorine content
- Sterilizes in presence of high organic contamination
- Sterilizes at high temperatures
- Has good shelf life
- Compounds easily

Data and samples available, write for bulletin PX-2

WALLACE & TIERNAN INCORPORATED
25 MAIN STREET, BELLEVILLE 9, NEW JERSEY

jelly has been New York's R. B. Willson, a director of the American Honey Institute and one of the world's largest dealers in honey and beeswax —and royal jelly. Willson, a prolific writer, has been supplying numerous articles to beekeeping journals and some of the cosmetic magazines.

Also helping spread the "word" about royal jelly has been a New York public relations firm, Philip Bloom and Associates. It was engaged by Charles of the Ritz when royal jelly was relatively unknown, did a skillful job of making American women conscious of royal jelly.

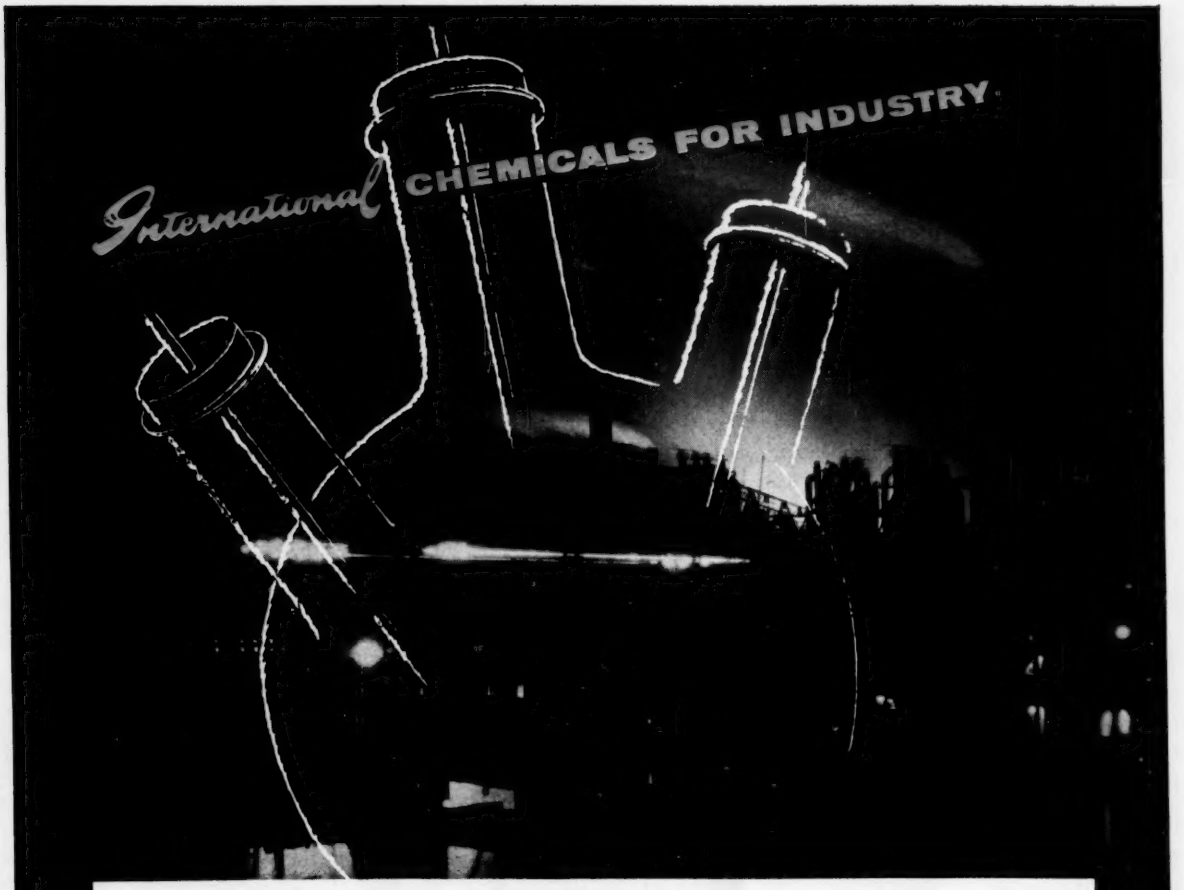
Pep from Bees: One characteristic of royal jelly heavily stressed by its producers has been its high vitamin content. Typical analysis of fresh royal jelly shows, per gram, approximately 200 micrograms of pantothenic acid, about 125 micrograms of niacin, 7 micrograms of riboflavin and 1 microgram of thiamine. Pyridoxin, biotin, inositol and folic acid are also present in minute quantities. Moisture content is high, averaging about 65% but often going as high as 80%.

One cosmetic manufacturer analyzes royal jelly shipments only for pantothenic acid as the active ingredient. Other chemists consider pantothenic acid unstable, doubt that any would still be present by the time royal jelly reaches the skin in cosmetics.

For 1% of the cost of royal jelly, manufacturers could add the equivalent amount of vitamins, one expert maintains. And the value of vitamins applied to the skin hasn't been proved.

There's a lot of controversy among cosmetic chemists about the value of royal jelly either as a skin aid or a merchandising idea. One beauty editor regards royal jelly as an outstanding example of the excesses that "jaundice the public against cosmetics, particularly creams and lotions."

Matter of Faith: Perhaps the best case for royal jelly is that cited by Hudnut's Powers. He told *CW* that "royal jelly gives a woman a reason for using creams and lotions. If cosmetics are to be effective, women must take them seriously and use them faithfully for two or three months. If the cream has something special in it, such as royal jelly, and costs a lot and comes in a pretty package, women will use it long enough to see results."



EXPERIENCE • RESOURCES • DEPENDABILITY

...In the production of CARBONATE OF POTASH and other industrial chemicals

You'll find many advantages in depending on *International* for carbonate of potash and other industrial chemicals such as caustic potash, magnesium oxide, muriatic acid and others. Specialized chemical experience and large production resources assure you product quality to meet your specifications, a variety of grades for specific purposes, prompt deliveries in any tonnages you need.

International's field men and representatives in all major industrial markets are well qualified to discuss the application of *International* chemicals to your production problems. They can help you select the most suitable materials and grades for highest operating efficiencies and maximum cost advantages. Write or phone for full information about *International Chemicals for Industry.*

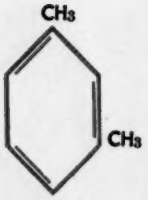
INTERNATIONAL MINERALS & CHEMICAL CORPORATION

POTASH DIVISION .... 20 N. Wacker Drive, Chicago 6

485 LEXINGTON AVE., NEW YORK 17 • MIDLAND, TEXAS • FULTON NATIONAL BANK BLDG., ATLANTA, GA.

ORONITE® META-XYLENE 95%

commercial intermediate for making dyestuffs, polyesters, perfume ingredients!



Commercially available Oronite Meta-Xylene may well provide you a better, more economical raw material as an alternative route in your present production. Or, this xylene isomer may offer you attractive opportunities for new or improved products.

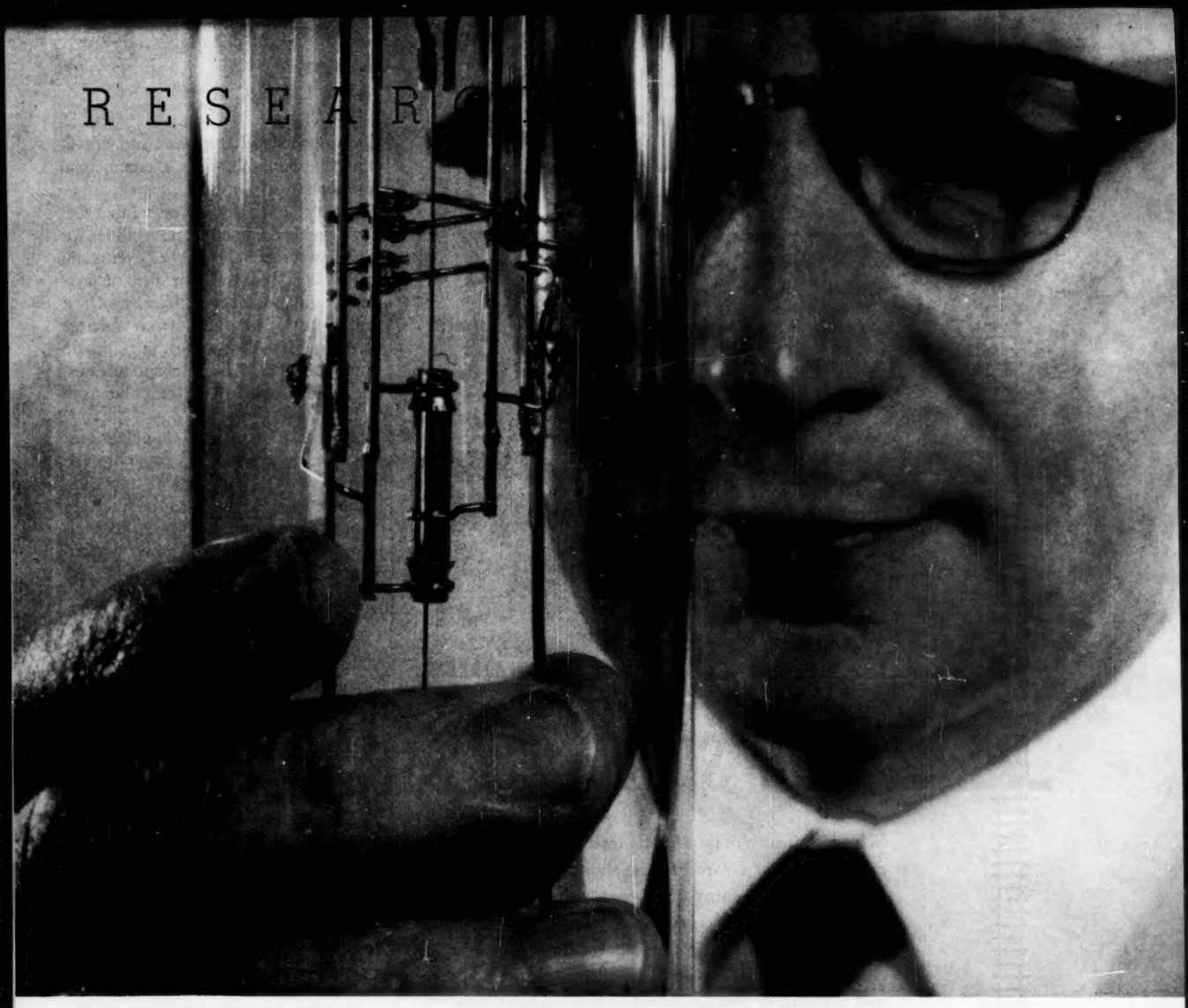
Oronite was the pioneer and is today the leading producer of Meta-Xylene—offering you commercial quantities in drums or tank cars with a 95% minimum purity. Contact the Oronite office nearest you for further information.

Possible Process	Name of Product	Possible Use of Product
Chlorination (hot)	Meta-xylyl chloride	Fumigant
Dichlorination (boiling)	Meta-xylylene chloride	Hydrocarbon resin
Chlorination and hydrolysis	Meta-xylyl alcohol	Solvent, esters
Chlorination and hydrolysis	Meta-xylylene glycol	Alkyd resins
Chlorination (5% iodine, darkness, 0°C)	4-Chloro-meta-xylene	Solvent
Dichlorination	2, 4-Dichloro-meta-xylene	Insect repellent
Oxidation and Chlorination	Tetrachloroisophthalic acid	Non-flammable coatings and textile impregnants
Oxidation and Amidation	N, N— Diethyl-meta-toluamide	Insect repellent
Oxidation (chromyl chloride)	Meta-tolualdehyde	Perfume bases
Oxidation	Meta-phthalaldehyde	Dyestuffs synthesis
Sulfonation (oleum)	Meta-xylene-4-sulfonic acid	Dyestuffs
Sulfonation (fusion)	2, 4-Xylenol	Frothing agent
Chlorination and catalytic hydrolysis	3, 5-Xylenol	Phenolic resins
Acidic formaldehyde condensation	Meta-xylene formaldehyde resin	Paints and varnishes
Nitration (nitric and sulfuric acids)	4-Nitro-meta-xylene	Solvent
Nitration and reduction or hydroxylamine hydrochloride and $AlCl_3$	4-Amino-meta-xylene (meta-xylidine)	Dyestuffs
Dinitration (below 5° C with sulfuric (D 1.84) and nitric (D 1.51) acids)	2, 4-Dinitro-meta-xylene	Intermediate
Nitration (sulfuric and nitric acids)	2, 4, 6-Trinitro-meta-xylene	Explosive
Sulfonation (1 part meta-xylene at 150° C with 4 parts oleum)	Meta-xylene 4, 6-disulfonic acid	Intermediate
Sulfonation and fusion	Meta-xyloresorcinol	Resin accelerator
Acetylation (acetyl chloride in presence of $AlCl_3$)	Dimethyl acetophenone (4-meta-xylyl methyl ketone)	Perfume intermediate
Alkylation and dehydrogenation	2, 4-Dimethyl-styrene	Thermoplastic rubber

ORONITE CHEMICAL COMPANY

EXECUTIVE OFFICES • 200 Bush Street, San Francisco 20, California
SALES OFFICES • New York, Wilmington, Chicago, Cincinnati, Houston, Los Angeles, San Francisco
EUROPEAN OFFICE • 36, Avenue William-Favre, Geneva, Switzerland

4483



New thermionic device of General Electric's Volney Wilson converts heat energy into electric power.

Tiny Cooker Boils Electricity Out of Metals

It's no trick to convert electricity directly into heat efficiently (e.g., with an ordinary flatiron), but reversing the process—at similarly high efficiency—is still a tough research problem. This week, a new electronic device was raising hopes that even the latter objective may be attainable. Called a thermionic converter, it's the invention of Volney Wilson, physicist at General Electric's metallurgy and ceramics research department (Schenectady, N.Y.).

Wilson has made a wide variety of the converters, which essentially consist of two electrodes maintained at high, but different, temperatures (2500 F vs. 1250 F) in a glass tube containing gas at very low pressure. Wilson won't identify the gas, except to say it must contain positive ions. But the composition of the electrodes is no secret. They may be any of several common metals. He has used molybdenum for both anode and cathode in the same unit. When the metal cathode is heated, it emits electrons ("boiled out"), which are collected on the metal anode.

In the laboratory, Wilson heats the electrodes electrically. This would make no sense in a practical generator, but in the lab it is a practical means of gauging heat input, subsequent efficiency of the converter.

No Threat to Turbines: So far, the thermionic converters have been able to change more than 8% of the applied heat energy into electric power. But that's not enough to mean serious competition for established power sources now (modern steam-turbine generators have efficiencies of about 40%), so GE is researching toward improved efficiencies.

There are aspects of the discovery, however, of greater importance than its commercial possibilities. As explained by Guy Suits, GE vice-president and director of research, the converter "has opened the door to new understanding of how electricity can be generated directly from heat without using machines that have moving parts. The thermionic converter is strictly one of those results of research that should be judged for

SHORT NOTICE

DELIVERY SERVICE

E brings ESPESOL solvents ON SCHEDULE

Why risk a production bottleneck caused by a delivery delay? Geared to the short notice requirements of many of its customers, Eastern States maintains adequate inventories of Espesol aromatic and aliphatic solvents for immediate shipment. Your individual specifications can be met accurately and delivered with unusual speed. Such service is typical with Eastern States. Typical, too, is the never-varying uniformity, quality and purity of these outstanding solvents. Learn how they can help you make a better product, today. Send the coupon below for further information.

Send for your copy today . . . ESPESOL SOLV-A-FILE

EASTERN STATES PETROLEUM & CHEMICAL CORPORATION
(Formerly Eastern States Chemical Corporation)
P. O. Box 5008 • Dept. C-1214
Houston 12, Texas • Phone: Walnut 3-1651
Please send me the Espesol Solv-a-file . . . the handy reference chart on the properties and characteristics of solvents.

NAME _____
FIRM _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

Chicago Office: 1011 Lake St., Oak Park, Ill., Phone Village 8-5410
New York Office: 10 Rockefeller Plaza, New York, N. Y., Phone Circle 7-2320

the knowledge it provides and not at this time considered as a commercial products."

That's not to say, however, that GE isn't eyeing commercial possibilities for the newcomer. It might eventually serve as a "topper" for turbine systems, add to their efficiency. Or it might utilize the heat from nuclear reactors or solar energy (e.g., in an earth satellite). All these applications, GE admits, are still in the "blue sky" category.

Heat-to-Electricity Combinations: Thermionic converters aren't to be confused, GE says, with thermocouples, which can also be used to generate electricity. Some thermocouple combinations have looked promising, only to prove impractical under required high-temperature operating conditions.

Nor have thermogalvanic cells (two similar electrodes maintained at different temperatures and separated by an electrolyte), solar batteries, or fuel cells (*CW, Sept. 22, '56, p. 40*) for the direct conversion of chemical energy into electricity proved entirely satisfactory, at least in commercial power applications.

But GE is looking at a variety of such methods, as well as the thermionic converter, hopes to find one of broad industrial potential among them.

PRODUCTS

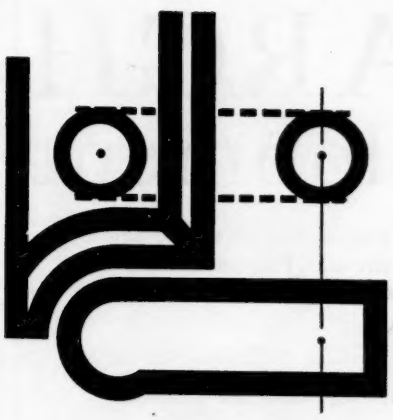
Enzyme Extract: Armalase A-100, Armour Laboratories' (Kankakee, Ill.) newest commercial enzyme, is a crystalline form of the natural enzyme, catalase. It is suggested for use in the brewing, soap, textile, fur, rubber, leather and cosmetic industries.

•

Tungsten Alloy: A new highly soluble (in molten steel), self-reducing tungsten alloy named Tung-Ad is available from Strategic Metals Corp. (Conshohocken, Pa.). Suggested for use in manufacturing tungsten-bearing tool, die and other alloy steels, it is reportedly very low in residuals such as cobalt, molybdenum.

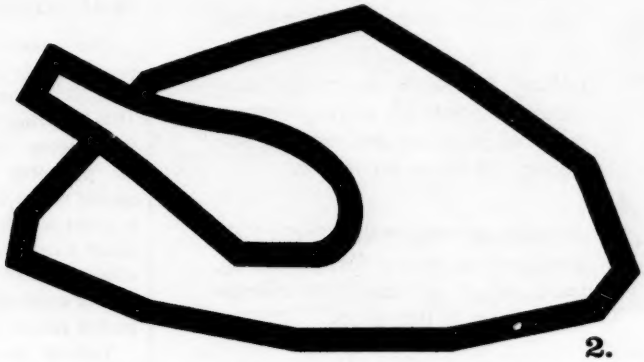
•

Nitrogen-15: Four new compounds of Nitrogen-15 are available from Tracerlab Inc. (Waltham, Mass.). They are 60% nitric acid, ammonium nitrate, potassium nitrate and ammonium sulfate. Each is available with



1.

PFIZERIDDLES



2.

1. How to save the eyesight of men who read blueprints? By preparing their paper with Pfizer Oxalates, blueprinters obtain a uniform photo-chemical reaction that gives sharp white lines against a vivid blue.

2. How to keep a fryer fresher longer? Processing with Pfizer BIOSTAT® slows growth of spoilage bacteria, permits food retailers to sell "scientifically fresher" poultry.

If you have a problem which might be solved by a high quality organic chemical, think of Pfizer first. Contact Dept. WP, Chas. Pfizer & Co., Inc., Chemical Sales Division, 630 Flushing Ave., Brooklyn 6, N.Y.

Some bulk products of this Division are:

CITRIC, TARTARIC, OXALIC ACIDS AND SALTS • ASCORBIC ACID • CAFFEINE • VITAMINS • ANTIBIOTICS • PLASTICIZERS

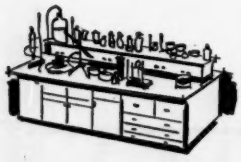
Pfizer

Chemical Sales Division

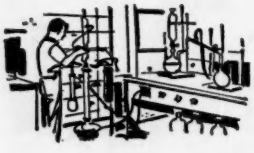
...sells more than 100 organic chemicals for food, medicinal and industrial uses.

CHEMICAL RESEARCH and development

Laboratory facilities for sponsored research and development have undergone tremendous growth in recent years. Prominent in this area is Vitro Laboratories, which has undertaken many significant projects for industry and government.

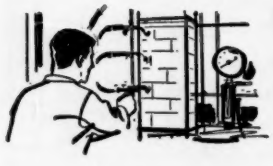


For instance, here are a few of the current fields of operation at Vitro's West Orange Laboratory:



COATING PROCESSES—including a novel technique for preparing specialty coatings, e. g., molybdenum on Inconel, wear-resistant lubricating coatings, metal-bonded abrasive structures, etc.

ORGANIC SYNTHESES—including fundamental studies of new vinyl-type monomers and polymers, and organo-phosphorus and boron derivatives.



SEPARATIONS PROCESSING—including homogeneous reactor fuel processing, ion exchange, and adsorption and solvent extraction techniques.

NUCLEAR WASTE DISPOSAL — including development of disposal units, evaluation of current processes, and consideration of fission product utilization.

HIGH TEMPERATURE CHEMISTRY—including study of reaction kinetics and mechanisms at high temperatures (1200°C), pilot plant design and operation, and corrosion studies.

Write for detailed information to **VITRO LABORATORIES,** *West Orange, N. J.*

A Division of

Vitro

CORPORATION of AMERICA

261 Madison Ave., New York 16, N.Y.

- Research, development, weapon systems
- Nuclear and process engineering, design
- Refinery engineering, design, construction
- Uranium mining, milling, and processing
- Thorium, rare earths, and heavy minerals
- Recovery of rare metals and fine chemicals
- Aircraft components and ordnance systems
- Ceramic colors, pigments, and chemicals

7% N-15 for $140/gm. and in a 25% N-15 form for $205/gm.

•

Drug Intermediate: Pilot-lot quantities of γ-aminobutyric acid, suggested as a pharmacutical intermediate (it has two reactive positions, a carboxyl group and a primary amino group), are available from General Mills Inc. (Minneapolis).

•

Low-Cost Peptones: For use in fermentation processes, Wilson & Co. (Chicago) offers three new peptones that reportedly feature high quality, low cost. They are sold in 55% active ingredient solutions, in bulk.

•

Hypotensive: Merck Sharpe & Dohme (Phila.) has developed chlorothiozide (6-chloro-7-sulfamyl-1.2.4-benzothiadiazine-1, 1-dioxide), tradenamed Diuril, for use in treatment of hypertension and as a diuretic agent.

Anticancer Progress

The government's drive to enlist more outside help in its cancer drug screening program (CW, April 6, p. 104) is hitting full stride. By last week, Washington was able to announce the awarding of its sixth one-year cancer research contract since June—a grant to Monadnock Research Institute (Antrim, N.H.). The six awards, valued at $793,000, are for the production of synthetic chemicals designed to inhibit cancer growth.

Two of the contracts—to Upjohn and the University of Chicago—are for new hormonal compounds that will get laboratory and clinical trials. Stanford Research Institute, Southern Research Institute, the Medical College of Virginia (Richmond) and Monadnock will prepare antimetabolites.

The six new contracts, however, are only a small part of a program to put the cancer chemotherapy program on a "crash" basis. In the next few weeks, U. S. Surgeon General Leroy Burney is expected to approve another $11 million in cancer drug research contracts. The money will cover 42 contracts already approved by the government's advisors on cancer chemotherapy. Of the 42 pending contracts, 18 will go to 13 drug firms that will share about $5 million in contract funds.

A substantial part of the remaining money will be used by nonindustry

Basic raw materials for VINYLS that wipe clean as new in seconds!

One of the most popular features of the new cars is their easy-to-clean vinyl upholstery. More and more, manufacturers of the plasticizers used in hundreds of new vinyl products are depending upon Enjay Isooctyl and Decyl Alcohols to assure superior results in formulation.

If you need technical help in the application or use of any Enjay petrochemical, you can get experienced guidance from Enjay. The modern, well-equipped Enjay Laboratories have recently been expanded and are at your service. Call or write for more information.

Enjay offers a widely diversified line of petrochemicals for industry:

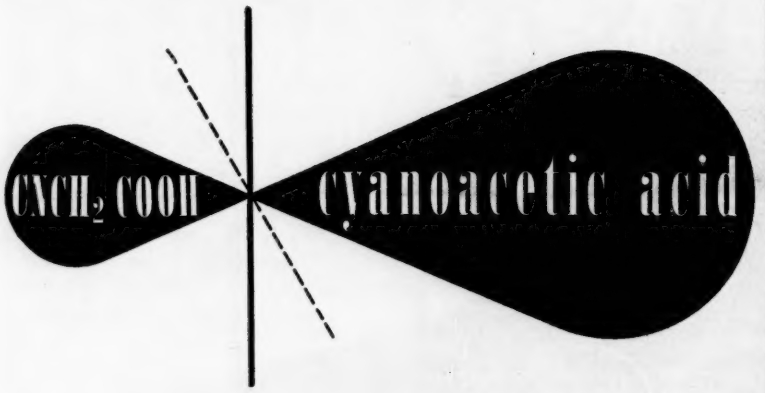
ALCOHOLS & SOLVENTS: Lower Alcohols, Oxo Alcohols, Ketones and Solvents; OIL & FUEL IMPROVERS: Detergent-Inhibitors, V-I Improvers, Oxidation Inhibitors; CHEMICAL RAW MATERIALS: Olefins, Diolefins, Aromatics; ENJAY BUTYL RUBBER & VISTANEX.

ENJAY

Pioneer in Petrochemicals

ENJAY COMPANY, INC., 15 W. 51st STREET, NEW YORK 19, N. Y. Akron, Boston, Chicago, Detroit, Los Angeles, New Orleans, Tulsa

KAY-FRIES



Cyanoacetic Acid is an intermediate for amino acids, barbiturates, dyes, the purine group, vitamins and other drugs. Chemically, its "cyano-activated" methylene group and easily hydrolized cyano group are particularly interesting.

KAY-FRIES SPECIFICATIONS

assay ● 98.0% min. (by acidity and hydrolysis) Kay-Fries CYANO-ACETIC ACID is exceptionally uniform in purity with water accounting for substantially all of the remaining 2.0%.

color ● 75 Hazen scale (10 g. of acid in 50cc dist. H_2O).

ash ● .075% maximum.

Typical reactions of CYANOACETIC ACID

ESTERIFICATION
$CNCH_2COOH + ROH \longrightarrow CNCH_2COOR + H_2O$

AMIDATION
$CNCH_2COOH + HNRR^1 \longrightarrow CNCH_2CONRR^1 + H_2O$

CHLORINATION
$CNCH_2COOH + PCl_3 + Cl_2 \longrightarrow CNCH_2COCl + POCl_3 + HCl$

HYDROLYSIS
$CNCH_2COOH + H_2O \longrightarrow CH_2(COOH)_2 + NH_3$

REDUCTION
$CNCH_2COOH + 2H_2 \longrightarrow NH_2CH_2CH_2COOH$

CONDENSATION
$CNCH_2COOH + RCOR^1 \longrightarrow RR^1C{=}C(CN)COOH + H_2O$

TECHNICAL BULLETIN AVAILABLE

WRITE OR PHONE

KAY-FRIES CHEMICALS, INC.

180 MADISON AVE., NEW YORK 16, N. Y., MURRAY HILL 6-0661

researchers to screen many of the 35,000 previously untested (for cancer) antibiotic filtrates and other raw chemical materials supplied to the government free of charge by drug companies.

Screening Centers: The National Cancer Institute's Cancer Chemotherapy National Service Center, which administers the program, hopes to complete this year's contract signings by Dec. 31. Recently signed: Abbott Laboratories, to a $208,000 contract for in-plant screening of chemicals.

The institute is limited by law to one-year contracts; as a result, some of the pending awards are renewals and expansions of existing contracts.

Whether the center can win a further boost in contract spending authority for next year depends mainly on its convincing Congress that more money will mean more rapid progress in finding a cancer cure.

There are other problems, too. Among the more urgent is the need for a patent policy to cover cancer drugs developed by government-financed industry research. Recently, industry was informed that the government would allow a company to patent any drug it develops with the help of federal funds.

But, government officials insist on retaining so-called "march-in" rights. Under these, if the patent owner fails to meet the full demand for his product—either from his own plants or by licensing competitors at a reasonable royalty—the Surgeon General may take over the drug patent and issue royalty-free licenses to other manufacturers.

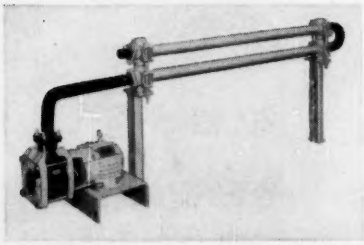
Some industry executives protest that such a provision, considering the enormous, sudden demand likely to develop for a successful drug, makes a mockery of patent ownership. They want the patent owner—on finding of short supply by the Surgeon General—to retain the right to choose the sublicensees and charge them a reasonable royalty.

Shared Expansion Burden: Ways of meeting the cost of new or expanded research facilities to carry out the necessary research are also under discussion. An agreement has been worked out whereby the government will negotiate, on an individual basis, the sharing of costs for renovating or rearranging existing laboratories.

News from
National Carbon Company
Division of Union Carbide Corporation · 30 East 42nd Street, New York 17, N. Y.
Sales Offices: Atlanta, Chicago, Dallas, Kansas City, Los Angeles, New York, Pittsburgh, San Francisco. IN CANADA: Union Carbide Canada Limited, Toronto

PROCESS EQUIPMENT BRIEFS

Packaged "Karbate" Recirculating-Type Heat Transfer Systems for Plating Applications



Corrosion resistance, long life, low cost — these are some of the advantages of the "Karbate" recirculating-type heat transfer system. Designed for economical heating and cooling of plating solutions, the system features proven "Karbate" centrifugal pump and concentric tube heat exchangers.

Standard package units, available immediately, provide 4.1 to 35.2 square feet of heat transfer surface and circulating pump capacities of 20 to 100 gallons per minute.

For details, contact National Carbon Company, P. O. Box 6087, Cleveland, O.

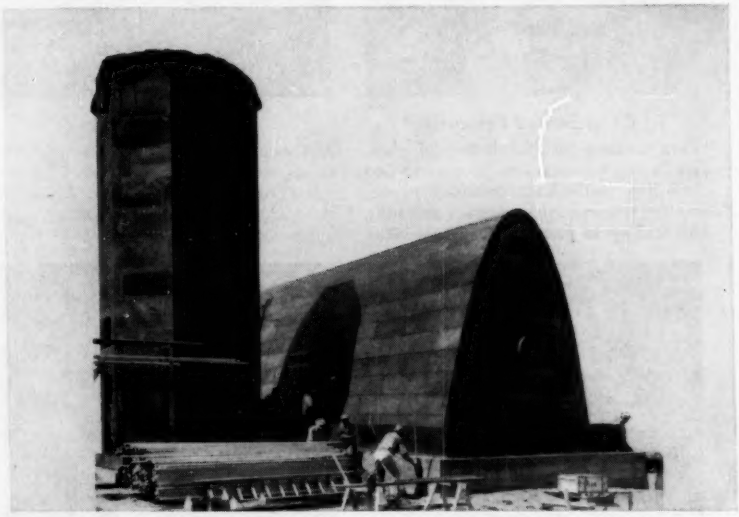
"Intalox" Saddle Packing Now Available in Carbon

Developed jointly by National Carbon Company and U. S. Stoneware Company, new carbon saddle packing has a wide range of chemical applications.

The new type saddles, sold under U. S. Stoneware's trademark "INTALOX", are recommended for hot alkalis, mixtures of hydrofluoric and sulfuric acids, hydrofluoric and phosphoric acids — applications where chemical resistant ceramics would be unsuitable. The new carbon saddles can withstand abrupt temperature changes without danger of spalling. Saddles assure maximum contact surface between liquid and gas or between liquid and liquid.

For details, contact U. S. Stoneware, 60 East 42nd Street, New York 17, N. Y.

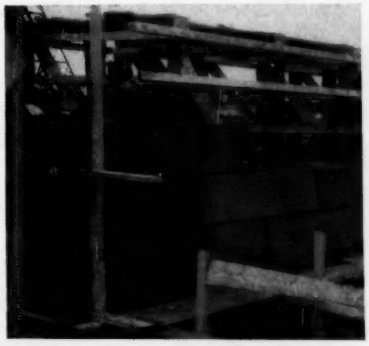
VERSATILE CARBON AND GRAPHITE STRUCTURES CUT COSTS IN HIGH TEMPERATURE CORROSIVE PROCESSES



This installation has one of the largest capacity combustion chambers ever built. Made of graphite, the burner chamber (on right) and the carbon hydrator tower (on left) produce phosphoric acid from elemental phosphorus for the Shea Chemical Co. of Jeffersonville, Ind.

Corrosion resistance and structural stability at high temperatures make carbon and graphite invaluable in combustion chambers, reactor vessel linings, bubble cap trays and packing support structures. Virtually immune to thermal shock, and with little expansion under heat, carbon and graphite can be used in reducing atmospheres up to 3000°C. Furthermore, high thermal conductivity enables water-cooled graphite structures to withstand up to 2000°F under oxidizing conditions.

Easily machined to close tolerances, carbon and graphite can be worked even by hand tools. Depending on size and process requirements, the materials can be supplied for either monolithic or segmental structures. Segmental structures have been built with walls 20′ long x 15′ high, using blocks 7½″ thick, 28½″ wide and 72″ long.



After a carbon or graphite structure is completed, shoring is removed. Special high joint-strength cement with essential properties of carbon and graphite bonds the blocks or slabs.

NATIONAL TRADE-MARK

The terms "National", "N" and Shield Device, "Karbate" and "Union Carbide" are registered trade-marks of Union Carbide Corporation.

UNION CARBIDE

Owens-Illinois Assures You A Complete Packaging Approach

Co-ordinated Research

Pure research into fabrication of glass, *packaging research* into processing and handling methods in customer plants, *market research* into consumer attitudes. All add up to greater packaging value.

Engineered Design

At Owens-Illinois, your package's *three* needs are taken into account: 1) Considerations of its function in the retail store, 2) its operating efficiency, and 3) its consumer utility.

The Right Container

Versatility of facilities and talents make O-I your best source of supply. In container development—beauty, utility, tradition are blended in the right proportions for your product's needs.

The Right Closure

Through long and continuing research O-I has developed the most advanced metal and plastic closures. Helping you choose the right closure is another function of O-I's packaging service.

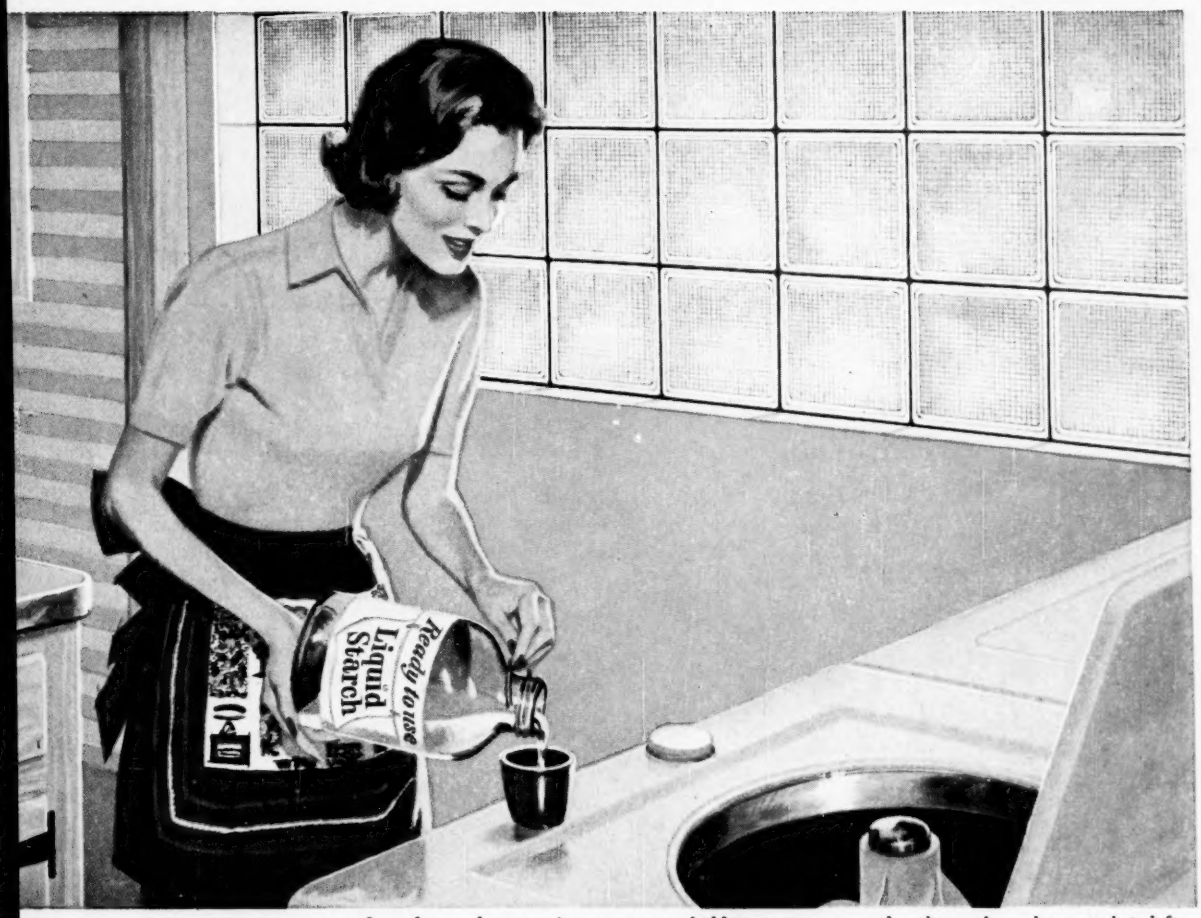
Needed Fitments

O-I specialists are keenly aware of sales benefits derived from plastic shaker and pour-out fitments which are not "gadgets" but which increase consumer satisfaction with your product.

Merchandising Cartons

Modern cartons are developed only through systematic consideration of their opportunity to serve you in the retail store and warehouse . . . as well as on your own filling line and in transit.

New convenience for liquid products! New *two-finger* handle by O-I . . . makes large-size containers so much easier for the housewife to use.



Laundry products in glass are easy to hold, easy to use... and a glance shows how much is left.

Look at all the freedom glass brings to washday packaging!

In today's market, your laundry product needs every packaging advantage: a new user convenience—an edge in eye appeal—or even the smallest reduction in volume-cost.

That's the beauty of glass packaging—*packaging freedom!* There are endless ways to improve your salespackage to make it work harder. Take, for example, these up-to-the-minute packaging ideas from Owens-Illinois.

The full-gallon jug. Ideal for volume items like liquid starch, where users are accustomed to buying for economy in big ½-gallon sizes. Users will appreciate the extra savings they get in the full-gallon jug. And it means the advantage of more economy to you, too!

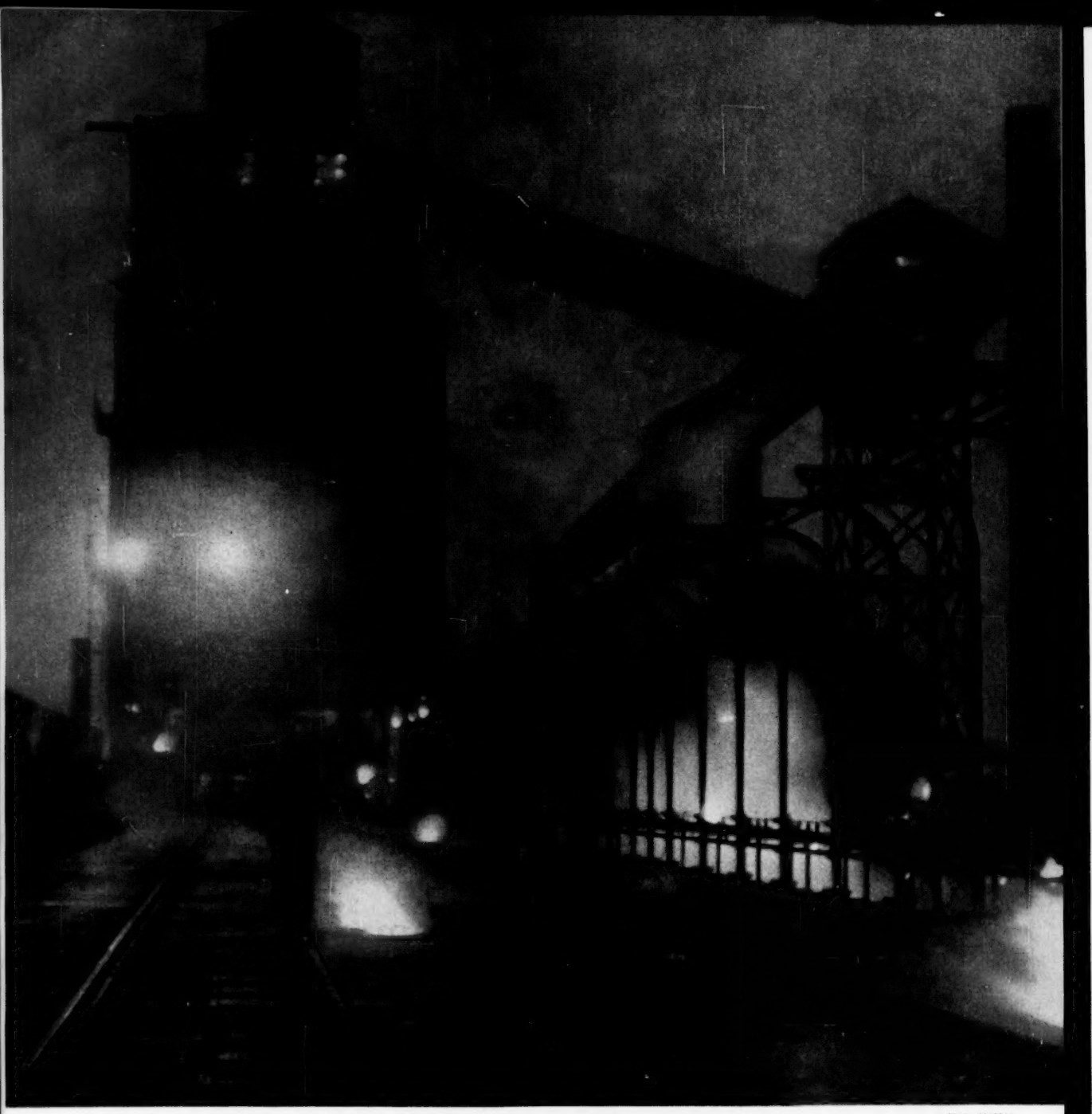
New two-finger handle. Gripped with two fingers, instead of one, economy sizes of liquid washday products seem so much lighter, far more convenient to use.

Bright, attractive ACL labels. Natural for premium-priced *washday* products like special cold-water compounds for woolens. Glass labeled with bright, colorful ACL label makes an eyecatching salespackage.

So for washday packaging—make it glass! Remember Owens-Illinois is the marketing-minded supplier of the *complete* salespackage—from over-all design to selection of the right container, closure and fitment.

DURAGLAS CONTAINERS
AN (O) PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO



IVAN MASSAR

Coke-oven cleanup is key to J&L's switch to petroleum-style refining of aromatics.

Coke Ovens Clean Up for New Competition

With the recent startup of a $2-million-plus refining plant at Jones & Laughlin Steel Corp.'s Aliquippa, Pa.. coke ovens (*above*), coal chemicals drove an opening wedge into the high-purity aromatics field, long dominated by products derived from petroleum. This bold move to re-establish the competitive position of coke-oven benzene, toluene and xylene will shortly gain added impetus from a similar plant soon to go onstream at U.S. Steel's Clairton, Pa., works.

Primary goal of J&L and USS in building coal chemicals refineries is to supply a greater part of raw material requirements for such fast-growing but purity-critical products as adipic acid (for nylon), plastics, synthetic detergents, insecticides, paints and aniline dyes. By upgrading by-product BTX to meet the rigid requirements of these products, the coke-oven operators are solving not

only their own difficult marketing problem but also a part, at least, of the BTX consumers' supply problem.

Capacity of J&L's refining plant is 56,500 gal./day of BTX (about 70% benzene, 20% toluene, 10% mixed xylenes). That's sufficient, says the company, to handle all the coke-oven aromatics turned out by its existing operations and foreseeable expansions. U.S. Steel's abuilding plant will handle an estimated 150,000 gal./day of crude coke-oven light oil of similar BTX composition.

Process Switch: For the change in cleanup tactics, coke-oven operators have adapted two processing techniques developed primarily for the petroleum industry. The first refining step employs hydrogenation for the removal of objectionable sulfur impurities; the second, solvent extraction of the desulfurized light oil for recovery of high-purity aromatics.

J&L's hydrogen-desulfurization utilizes a Hydrofining process, licensed by Esso Research and Engineering Co. and adapted for this coke-oven application by Badger Mfg. Co. The key unit in this operation is a fixed-bed reactor charged with metal oxide catalysts on alumina. Crude light oil is heated, mixed with a hydrogen steam and hydrogenated at 400-800 F, 50-800 psig. Sulfur-bearing contaminants are converted into hydrogen sulfide, removed by a stripping operation.

Extraction of the sulfur-free aromatics (final products contain less than 1 ppm. sulfur) is performed in a Udex extraction unit with diethylene glycol-water solvent. This stage eliminates saturated hydrocarbons (i.e., paraffins), supplies a high-purity BTX stream to subsequent clay-treating and fractionation units. Finished products: benzene of 5.4 C (41.7 F) solidification point; toluene containing less than 0.1% saturated hydrocarbons; mixed xylene isomers.

A major feature of the refining process, says J&L, is its ability to turn out high-purity products without making intermediate materials. To further enhance this characteristic advantage, the highly instrumented distillation equipment is automatically controlled to maintain product yield at an optimum.

Hydrogenation Alternate: The refinery going up at U.S. Steel's Clairton coke plant follows the same purification scheme, but will employ Koppers' Super-Refining process for the desulfurization step. Based on a German process developed by Badische Anilin- & Soda-Fabrik and Scholven-Chemie, Super-Refining differs from Hydrofining mainly in the pretreatment of the crude light-oil feedstock. Before being introduced into the catalytic reactor, the preheated oil is pumped into a holding tank to permit polymerization and removal of high-boiling, gum-forming components. The light-oil vapors are then combined with hydrogen, heated to 320 C and fed into the reactor.

USS will also employ Udex extraction for final purification, conventional fractionation for separation of the purified BTX stream.

Cleanup Economics: Though neither J&L nor USS had disclosed a breakdown of its capital investment or anticipated operating costs, the refinery treatment of coke-oven BTX appears to offer several economic advantages over the conventional acid-washing process. For one thing, the hydrogenation-extraction cycle reduces refining losses to considerably less than the 8.5% (by volume) commonly lost during acid treating. And by elimination of the corrosive acids, it does away with a major source of troublesome, costly maintenance.

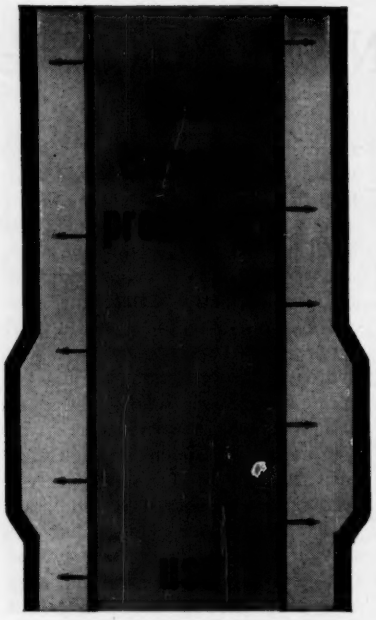
The combination of improved product recovery and purity gives the hydrogenation-extraction process a decided edge over other light-oil refining methods, despite its relatively high capital investment and operating costs. A study by Koppers of several refining systems shows that additional profit from the sale of upgraded BTX may be expected to increase proportionately faster than capital and operating costs of additional refining facilities (*see table below*).

It's also evident from these cost estimates that the source of hydrogen used for desulfurization has considerable influence on refining costs. Reason: hydrogen partial pressure is the controlling factor in the desulfurization reaction, therefore determines required operating temperature and pressure. The choice of a suitable

Economics of 8-million gal./year plant for refining coke-oven BTX*

Process	Capital Required	Annual Operating Cost	Annual Incremental Profit
Secondary 100% H_2SO_4 wash of benzene	$150,000	$427,630	$17,975
Catalytic refining of acid-washed benzene, with hydrogen from NH_3	$380,000	$498,700	($29,690 loss)
Catalytic refining of crude benzene, with hydrogen from NH_3 . . .	$650,000	$420,905	$53,965
. . with extraction included	$1,330,000	$543,055	$60,605
Catalytic refining of crude benzene and toluene, with hydrogen from natural gas reforming . . .	$960,000	$474,920	$135,565
. . with extraction included	$1,790,000	$596,375	$194,055
Catalytic refining of crude BTX, with hydrogen from coke-oven gas	$1,110,000	$526,160	$237,060
Catalytic refining of crude BTX, with hydrogen from natural gas reforming . . .	$1,060,000	$424,365	$261,680
. . with extraction included	$1,940,000	$509,280	$382,110

*from Koppers' estimated costs for an 8-million-gal./year crude BTX throughout.



UCON

BRAND

fluids and lubricants

Ucon heat-transfer fluids do not ordinarily sludge, coke, or gum after months of use at temperatures as high as 450-500°F. Thus, electric immersion heaters and other heat-transfer surfaces stay clean and give long, continuous operation.

Ucon heat-transfer fluids have good viscosity stability and low pour points. These properties permit operation over wide temperature ranges yet eliminate cold weather problems and the need for auxiliary heating equipment.

Ucon fluids and lubricants also give top performance as:

- Rubber and textile lubricants
- Hydraulic fluids
- Cosmetic components
- Anti-foam agents
- Chemical intermediates

Get the facts. Write for the booklets "Ucon Heat Transfer Fluids" and "Ucon Fluids and Lubricants."

UNION CARBIDE CHEMICALS COMPANY

DIVISION OF UNION CARBIDE CORPORATION

30 East 42nd Street, New York 17, N. Y.

"Ucon" is a registered trade-mark of UCC

ENGINEERING

hydrogen source is therefore limited by the size of the refining plant. If, for example, coke-oven gas with a hydrogen content of 52% is used, the operating pressure in the hydrogenation unit must be about twice that required by pure hydrogen. And high-pressure equipment becomes a major cost item as plant size increases.

For small plants (e.g., those with capacities of less than 70,000 gal. a day), coke-oven gas may be entirely satisfactory. Koppers includes coke-oven gas in estimated requirements of its process; Scholven-Chemie has used it in the original German plant, but prefers to use pure hydrogen. And the use of coke-oven gas is plugged as one of the features of a modified Lurgi refining process offered by Blaw-Knox.

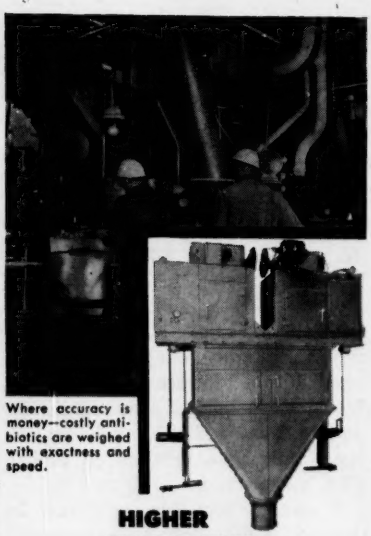
J&L's refinery was started up on hydrogen produced by ammonia dissociation units, will later switch to pure hydrogen. USS consumes large quantities of natural gas, will likely derive its hydrogen from that convenient source.

PROCESSES

Underground Gasification: "Electrolinking carbonization" is the U.S. Bureau of Mines' name for its new method of preparing coal for *in situ* coal gasification by high-voltage electricity. Developed by USBM and Alabama Power Co. at Gorgas, Ala., the method is aimed at obtaining energy and chemicals from coal without mining it. Key is development of an economical technique for establishing a channel in the coal through which the gas-making agent can pass. The USBM solution is to insert electrodes into boreholes deep in the coal vein, and to pass a current through the coal. The heat generated carbonizes the coal, making it porous. Air, oxygen, steam or mixtures of them can then be pumped through the boreholes—passing through the hot coal, where they react to form gas.

•

Coal Gasification: New interest in conventional gasification is shown by British plans to build two new plants —one in Scotland, the other in the west Midlands of England. British interest in finding less costly gas sources is sparked by a diminishing supply of good-quality coking coal. Both plants will use the Lurgi process.



Where accuracy is money—costly antibiotics are weighed with exactness and speed.

HIGHER PRODUCTION AT LOWER COST with RICHARDSON

Automatic

BAGGING SCALES

Day in, day out, Richardson Automatic Bagging Scales at work in chemical processing plants provide close weighing accuracies in high speed bagging operations. The result: higher unit production, higher unit profit!

With average accuracies from 0 to ± 3 ozs. per 100 lbs., your profits no longer go into overweight bags. And you don't run the risk of underweights that make for unhappy customers, either! Richardson Automatic Scales are the *economical way* to end bagging and weighing tie-ups and reduce production costs.

Richardson Scales are available to weigh and bag quantities from 25 to 350 lbs. at speeds that will best suit your operation. Materials handled include free flowing, non-free flowing, dusty, granulated, pelletized... or, *you* name it. If bulk weighing or proportioning equipment better suits your needs, Richardson can provide that, too.

More than 55 years' experience in the business of materials handling by weight qualifies Richardson to serve you wisely and well. Let us put our knowledge to work for you. Write for further information today. 4677

Richardson

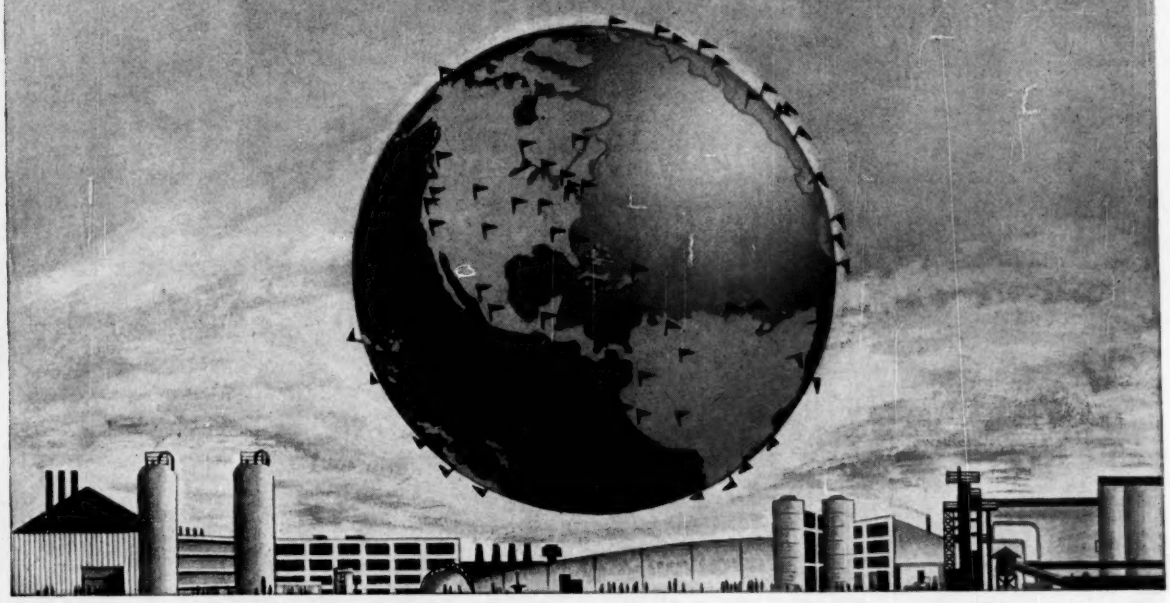
MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY, Clifton, N. J.

Atlanta • Boston • Buffalo • Chicago • Cincinnati
Houston • Memphis • Minneapolis • New York
Omaha • Philadelphia • Pittsburgh • San Francisco
Wichita • Montreal • Toronto • Havana • Mexico City
San Juan • Geneva, Switzerland
Nottingham, England

HARSHAW makes over 1,000 CHEMICALS for more than 15,000 customers in 50 varied industries throughout the world!

HARSHAW CAN SERVE YOU!



HARSHAW sells chemicals —thousands of them— for these and many other industries throughout the world

Abrasives
Aeronautica
Automotive
Brick and Tile
Ceramic
Cement and Concrete
Cosmetic
Disinfectants
Electrical Manufacturing
Electroplating
Enamel
Engraving and Electrotyping
Feed Stuff, Mineral Feed
Fertilizer
Food
Glass
Insecticide and Fungicide
Laundry
Leather
Lithographing
Linoleum and Floor Covering
Lubricant
Match
Metallurgical
Metal Working
Oil Cloth
Optical
Paint, Varnish and Lacquer
Paper
Petroleum
Pharmaceutical
Photographic
Porcelain Enamel
Plastics
Pottery
Printing Ink
Pyrotechnic
Refractories
Rubber
Shade Cloth
Soaps
Textile
Veterinary Remedies
Welding Electrodes
Wall Paper

Here are typical Harshaw chemical products

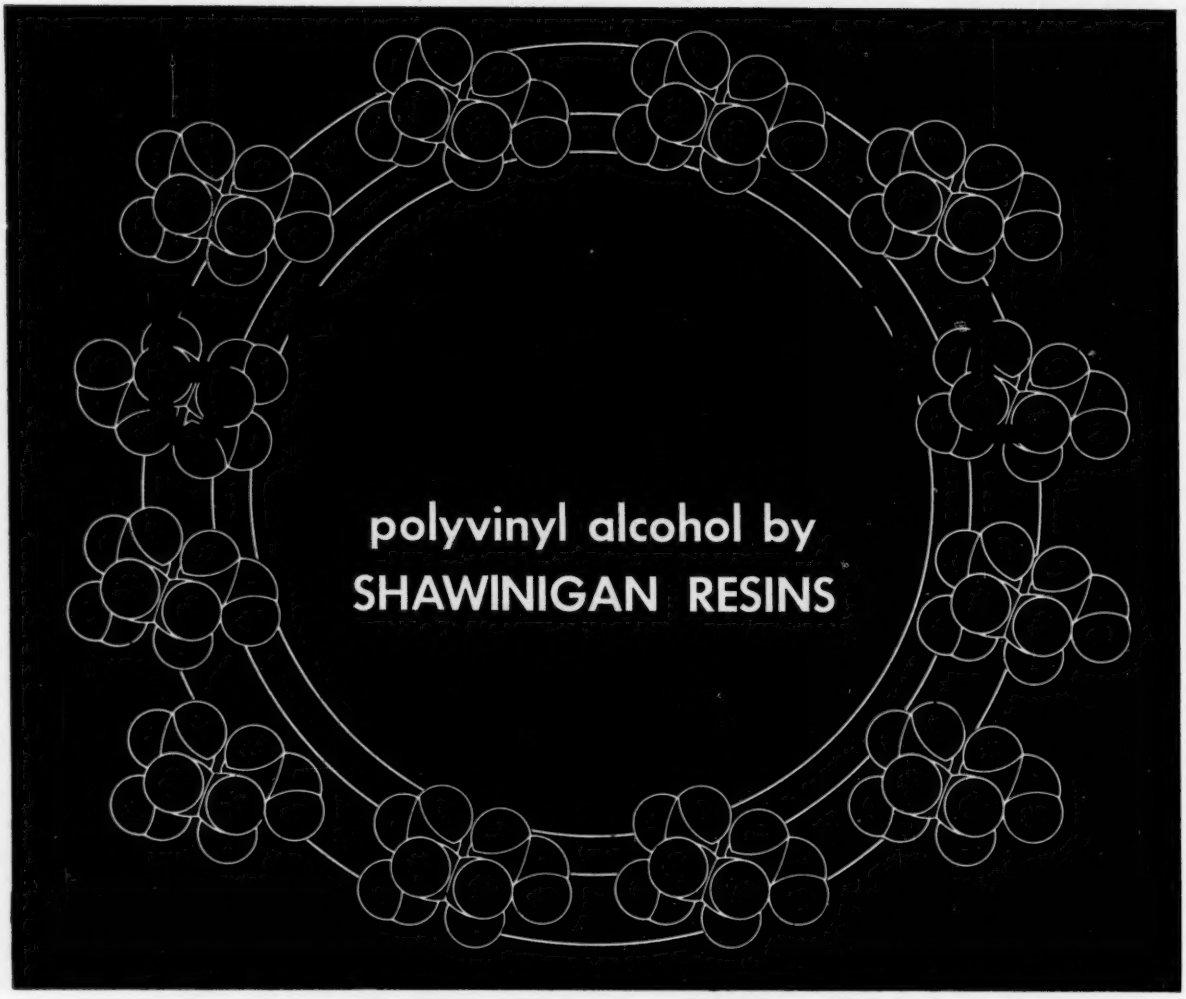
Electroplating Salts, Anodes and Processes
Organic and Inorganic Dry Colors and Dispersions
Driers and Metal Soaps
Vinyl Stabilizers
Ceramic Opacifiers and Colors
Fluorides
Glycerine
Preformed Catalysts, Catalytic Chemicals
Synthetic Optical Crystals
Agricultural Chemicals
Fungicides
Chemical Commodities

THE HARSHAW CHEMICAL CO.

1945 EAST 97th STREET • CLEVELAND 6, OHIO
Chicago • Cincinnati • Cleveland • Hastings-On-Hudson, N.Y. • Houston
Los Angeles • Detroit • Philadelphia • Pittsburgh

FREE! This 16-page booklet lists the many chemicals available from Harshaw.

WRITE TODAY FOR YOUR COPY



available in 12 grades

Twelve grades of commercially proved GELVATOL now are at your disposal for more efficient, more profitable formulating. This series of resins is of unequaled quality and uniformity . . . features which have been proved on the production line.

Consider these advantages:

1. Notable uniformity from bag to bag, lot to lot.
2. Particle size minimizes product loss caused by dusting.
3. High bulk density reduces size of 50 lb. bag . . . makes it easier to handle—cuts storage space requirements.
4. High quality—less tendency for the resin to lump when added to water—you get clear solutions fast.

Standard grades of GELVATOL are suitable for all applications including adhesives, textile sizes, paper coatings, and films. What's more, the new, extremely low viscosity grades offer a unique combination of properties for specialty applications.

Whatever your needs, remember that in GELVATOL there is the *right* grade for you. Write today for full technical information and sales service, to Shawinigan Resins Corporation, Dept. 1150, Springfield 1, Mass.

SALES OFFICES: ATLANTA CHICAGO LOS ANGELES
NEW YORK SAN FRANCISCO

GELVATOL®— *polyvinyl alcohol by*

SHAWINIGAN RESINS®

Chemical Ad Managers vs. the Mayor

Fertilizers:
"It's the dead hand of bureaucracy reaching into a live business. The consumer will foot the bill. It's got to be fought by everyone."

Antifreeze:
"I'm all against it. We use an enormous amount of local media advertising."

Cleaning compounds:
"A very dangerous precedent—the sort of thing that other municipalities will take a good look at. In that case, it would have an important effect on ad budgets."

Cosmetics and pharmaceuticals:
"How anyone can be for the tax, I can't see. It's just increased taxation without any increase in city services."

Industrial chemicals:
"If they get away with it there, I think the tax will spread."

WIDE WORLD

Baltimore's Mayor D'Alesandro: "The tax is politically unwise . . . but necessary."

Baltimore's Ad Tax Draws CPI's Fire

Call it what they may—"the dead hand of bureaucracy" or "rank unfair discrimination"—chemical advertising men are taking a sharply critical stand this week on the new ad tax that Baltimore will start collecting Jan. 1.

Although few chemical producers are taking official stands, privately they are concerned.

Although the tax will cost advertisers an estimated $4 million/year, criticism centers on the broad significance of the tax rather than the actual dollars and cents involved. "If Baltimore gets away with it," said one ad manager, "every major city in the country will follow suit."

Brainchild of Baltimore's mayor, dapper Tom D'Alesandro, the assessment amounts to a charge to the advertiser of 4% of his advertising outlay in local media. Local radio, TV, billboards and publishing will all be affected. Moreover, network and nationally distributed Sunday newspaper supplement promotion * may be taxed for a share proportionate to the value of services of the Baltimore outlet.

In addition, local media will ante up 2% of their gross advertising revenues. In the chemical process industries, consumer chemical advertisers will bear the brunt of the taxes' direct effect. Antifreeze, alcoholic beverages, cosmetics, soap and detergents, pharmaceuticals and proprietaries, synthetic textile fibers, and batteries are among the items promoted heavily in local media. But because Baltimore is only the 12th-largest national marketing area, chemical product advertising there is limited and its tax payment would be correspondingly small.

Temptation: The real significance, chemical promotion executives emphasize, is that other cities may hop on the bandwagon, install similar taxes. One fertilizer ad manager put it this way: "The $10-billion advertising business will be a tempting plum."

Support for that viewpoint came unexpectedly last week from St. Louis, where the board of aldermen received a "package" of tax proposals that included Baltimore-style ad taxes. Already, several states have advertising sales taxes. And four years ago, New York considered taxing some 30 services (including advertising) but dropped the proposals under a barrage of heavy criticism.

Apart from the fear of a snowballing effect, chemical ad men oppose the tax on these grounds:

• Costs: The tax will add to the cost of selling to the Baltimore area. Even if network or supplement-type

*The law is murky on this point. But legal counsel for advertising trade organizations believe the levy will apply in such cases.

with **BARECO...**
WAX is an END PRODUCT, NOT a by-product!

The manufacture of waxes is our business—our *only* business! Making a superior wax is our goal from start to finish—and not a secondary product of our manufacturing efforts. In fact, any "by-products" at Bareco are incidental only to the refining of wax.

This specialization in the study, development and manufacture of microcrystalline waxes explains why so many Bareco products are unequalled in the industry.

It explains, too, why Bareco is in a unique position to offer authoritative assistance to wax users—whatever their problems or product.

FREE WAX BOOK — *Lists types and specifications to meet your wax problems. Write for your copy to Box 2009, Tulsa, Oklahoma*

Petrolite **BARECO WAX COMPANY**
A DIVISION OF PETROLITE CORPORATION

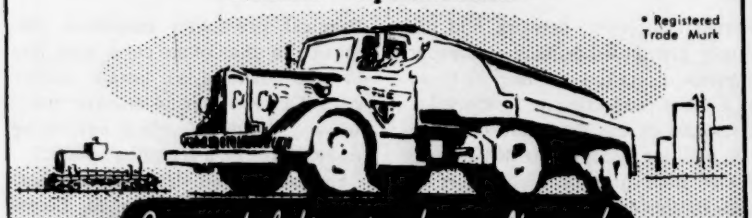
SALES OFFICE: Box 2009, Tulsa, Oklahoma

DISTRICT SALES OFFICES:
NEW YORK
150 E. 42nd St.
CHICAGO
332 S. Michigan Ave.
PHILADELPHIA
121 S. Broad St.

ALCOHOLS

Methanol • Isobutanol • "Synasol"* • "Anhydrol"* Isopropanol 91%—95%—99% • Secondary Butyl Alcohol n. Butyl Alcohol • Methyl Amyl Alcohol "Hexalin"* cyclohexanol

* Registered Trade Mark



Prompt deliveries from Newark

ALCOHOLS
KETONES
ESTERS
AMINES

CHLORINATED SOLVENTS
AROMATIC SOLVENTS
ALIPHATIC NAPHTHAS

PLASTICIZERS
GLYCOL ETHERS
GLYCOLS

THE CP **CHEMICAL SOLVENTS** INCORPORATED

60 PARK PLACE, NEWARK 2, NEW JERSEY — MArket 2-3650 WOrth 2-7763

promotion isn't included, the levy on the local media's gross revenue must eventually be worked into charge structures. Administrative costs for record-keeping must be considered, too.

• Discrimination. One business activity has been singled out for special taxation while others remain untaxed.

• Business retarder. Because the tax will surely be passed along (indirectly through higher retail prices) to consumers, their purchasing power will be correspondingly decreased. This point was stressed by a spokesman for Olin Mathieson.

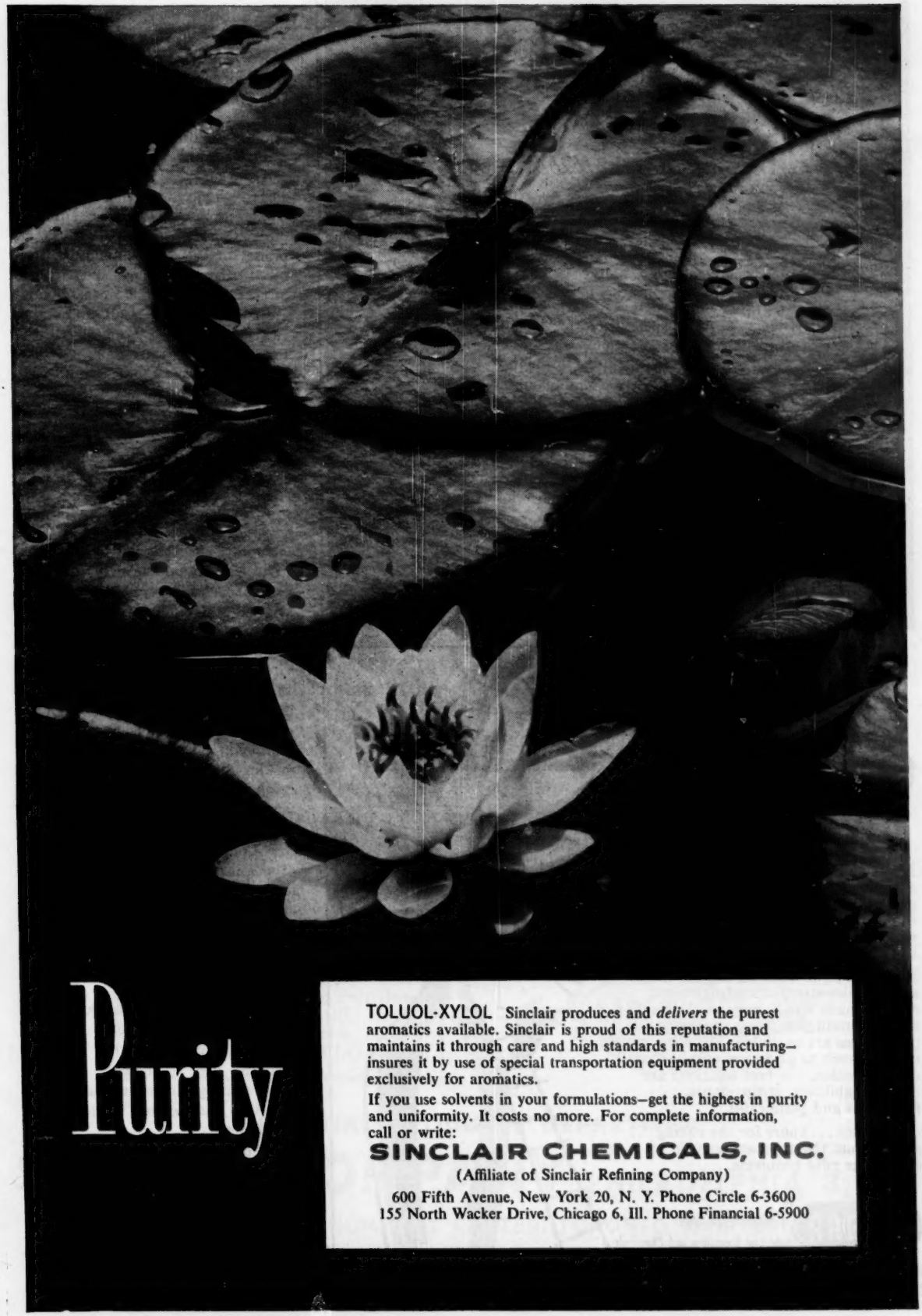
What effect will local ad taxes have on chemical consumer promotion? Almost to a man, chemical advertising managers believe there'll be a marked tendency to cut back advertising and, where possible, use media based outside the area. "It will mean," said a spokesman for a cleaning compound producer, "higher costs per thousand people reached. That means Baltimore may drop from more important "B"-schedule advertising to less important "C"-schedule levels." Also, some companies may switch radio and TV schedules to nearby Washington.

Future Course: Most chemical producers, including those most likely to be hit, are content now to fight the tax through the advertising trade associations. None contacted by *CW* is planning individual action. The trade organizations, of course, are mapping energetic "public education" campaigns and supporting legal tests. And Baltimore media have already applied to the courts for injunctions to prevent collection and for a ruling on the constitutionality of the law.

Undoubtedly, decision on the legality of the Baltimore tax will be a long time coming. But if the levy stands up, say many observers, the precedent will be set—a precedent that, should it be followed elsewhere, will cost consumer chemical companies a hefty bundle of bills.

DATA DIGEST

• **Hydraulic fluids:** Selection, operation and maintenance of hydraulic fluids for industrial machinery is discussed in a 24-page bulletin intended for industrial use only (does not apply to fluids for aircraft or mobile equipment). Subjects include viscosity recommendations, suggestions for prevention of rust and corrosion, reser-



TOLUOL-XYLOL Sinclair produces and *delivers* the purest aromatics available. Sinclair is proud of this reputation and maintains it through care and high standards in manufacturing—insures it by use of special transportation equipment provided exclusively for aromatics.

If you use solvents in your formulations—get the highest in purity and uniformity. It costs no more. For complete information, call or write:

SINCLAIR CHEMICALS, INC.

(Affiliate of Sinclair Refining Company)

600 Fifth Avenue, New York 20, N. Y. Phone Circle 6-3600
155 North Wacker Drive, Chicago 6, Ill. Phone Financial 6-5900

Biochemical Department

THE ARMOUR LABORATORIES
A DIVISION OF ARMOUR AND COMPANY

Announcing availability of...

ARMALASE® A-100

(Catalase)

A purified enzyme that rapidly destroys Hydrogen-Peroxide and may have application in the following industries:

COSMETIC —bleaching of hair and skin

PHARMACEUTICAL—fermentation processes such as in the manufacture of antibiotics

FOOD —cheese, whole milk and milk products (pending approval by the FDA)

MISCELLANEOUS —emergency source of oxygen
—sterile water production
—ingredient in culture media
—production of foam rubber
—bleaching of fur and wool

Our technical representatives are always available for consultation.
Write for additional information and details:
BIOCHEMICAL DEPARTMENT, THE ARMOUR LABORATORIES
KANKAKEE, ILLINOIS

Getting to the Source of your Odor Problems!

Effective odor control can be accomplished only when experience and proper facilities are combined to attack the problem *at its source.* That is the *best reason* for bringing your odor problems to Sindar specialists.

For masking ill-smelling ingredients or adding sales-stimulating fragrances, custom-made scents designed to meet specific production needs and odor preferences are available. For other causes of odor, such as oxidation and bacterial decomposition, the best solutions are Sindar stabilizers, antioxidants, fungicides and germicides.

Our service... yours for the asking... may be just the approach needed to solve your odor problems.

SINDAR® Corporation
Industrial Aromatics and Chemicals
330 West 42nd Street
New York 36, N. Y.

SALES

voir requirements, and preventive maintenance measures. Vickers, Inc. (Detroit).

• **Atomic Forum papers:** The Atomic Industrial Forum has made available papers from its recent conference on "The 1957 Nuclear Industry." Subject areas include: research and test reactor progress, uranium production, radiation applications, appraisal of the atomic industry, reactor fuel reprocessing, and financial protection against nuclear liability. An average of five papers are listed under each subject area. Atomic Industrial Forum (New York).

• **Activated carbon:** Helpful hints on use of Nuchar activated carbon for removing impurities and objectionable taste and odors are discussed in 12-page booklet. Industrial Chemical Sales Division, West Virginia Pulp and Paper Co. (New York).

• **Catalog:** Specifications and prices are listed for rare sugars, amino acids, laboratory reagents and biochemicals. Pfanstiehl Laboratories, Inc. (Waukegan, Ill.).

• **Wet-ground mica:** New bulletin reports studies dealing with use of wet-ground mica in traffic paints. Wet-Ground Mica Assn., Inc. (New York).

• **Thermosetting plastic:** Bulletin describes Speedi-set plastic molding compound. It's a single-component, thermosetting, flexible plastic used in making molds for casting cold-setting ceramics and plastics. Duramics Products Division, Technion Design and Mfg. Co. (New York).

• **Compressed gases:** Combination catalog-manual lists prices and technical data on 76 compressed gases and mixtures. Complete line of automatic gas regulators, controls, flowmeters and safety devices is also described. The Matheson Co., Inc. (East Rutherford, N. J.).

• **Industrial chemicals:** A 16-page booklet describes characteristics, grades and containers for 24 basic chemicals used by industry, including organic, inorganic and specialty products. Olin Mathieson Chemical Corp. (Baltimore).

• **Chemical intermediates:** New catalog describes complete product lines, including chemical intermediates for the dyestuff, pigment and pharmaceutical industries, as well as isocyanates for foam, adhesive, resin, elastomer and other end-uses. The Carwin Co. (North Haven, Conn.).

From Sun's refinery at Marcus Hook, Pa...

FAST, DIRECT DELIVERIES OF ANHYDROUS AMMONIA

New plant, delivering commercial and refrigeration grades, has 300-ton daily capacity.

If your plant is located east of Chicago, particularly in the Industrial and Agricultural Northeast, you have a new, direct source of supply for anhydrous ammonia at Sun Oil Company's Marcus Hook, Pennsylvania, refinery.

The strategic location of Sun's Marcus Hook plant on fast, direct-rail throughways and its high production capacity assure you of quicker deliveries and more reliable delivery service. Find out today how Sun's direct-rail service can help ease your scheduling problem.

STORAGE AND HANDLING OF ANHYDROUS AMMONIA

If you would like information on prices, delivery, or the storage and handling of anhydrous ammonia, call your nearest Sun representative or write to SUN OIL COMPANY, Philadelphia 3, Pa. Dept. CW-12.

Other Sun Petrochemicals: Benzene, Toluene, Xylene, Propylene Polymers, Sulfonate OS, Naphthenic (Sunaptic®) Acids, Liquid Petroleum Polymer (PDO-40).

SUNOCO

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY PHILADELPHIA 3, PA.

© SUN OIL CO., 1957

IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL

IGEPON®

Increases effectiveness of industrial and household detergents.

Improves rinsing property of soaps.

Stable Anionic Surfactants with Outstanding Dispersing and Suspending Properties

Soluble in all types of processing liquors.

Effective in concentrated electrolytes.

IGEPON T	$C_{17}H_{33}-\overset{O}{\overset{\|\|}{C}}-N(\overset{CH_3}{\overset{\|}{}})-CH_2-CH_2-SO_3Na$ *Red Oil Fatty Acids*	**DETERGENT**
IGEPON TC	$C_{11}H_{23}-\overset{O}{\overset{\|\|}{C}}-N(\overset{CH_3}{\overset{\|}{}})-CH_2-CH_2-SO_3Na$ *Coconut Oil Fatty Acids*	**DISPERSANT**
IGEPON TK	$C_{19}H_{29}-\overset{O}{\overset{\|\|}{C}}-N(\overset{CH_3}{\overset{\|}{}})-CH_2-CH_2-SO_3Na$ *Tall Oil Acids*	**WETTING AGENT**
IGEPON CN	$CH_3(CH_2)_{14}-\overset{O}{\overset{\|\|}{C}}-N(\overset{C_6H_{11}}{\overset{\|}{}})-CH_2-CH_2-SO_3Na$ *Palmitic Acid*	**FOAMING AGENT**
IGEPON TN	$CH_3(CH_2)_{14}-\overset{O}{\overset{\|\|}{C}}-N(\overset{CH_3}{\overset{\|}{}})-CH_2-CH_2-SO_3Na$ *Palmitic Acid*	
IGEPON TE	$C_{17}H_{33}-\overset{O}{\overset{\|\|}{C}}-N(\overset{CH_3}{\overset{\|}{}})-CH_2-CH_2-SO_3Na$ *Tallow Fatty Acids*	

Our sales and technical staff will be happy to consult with you on the application of Igepon in your specific process.

From Research to Reality

ANTARA gaf

ANTARA CHEMICALS

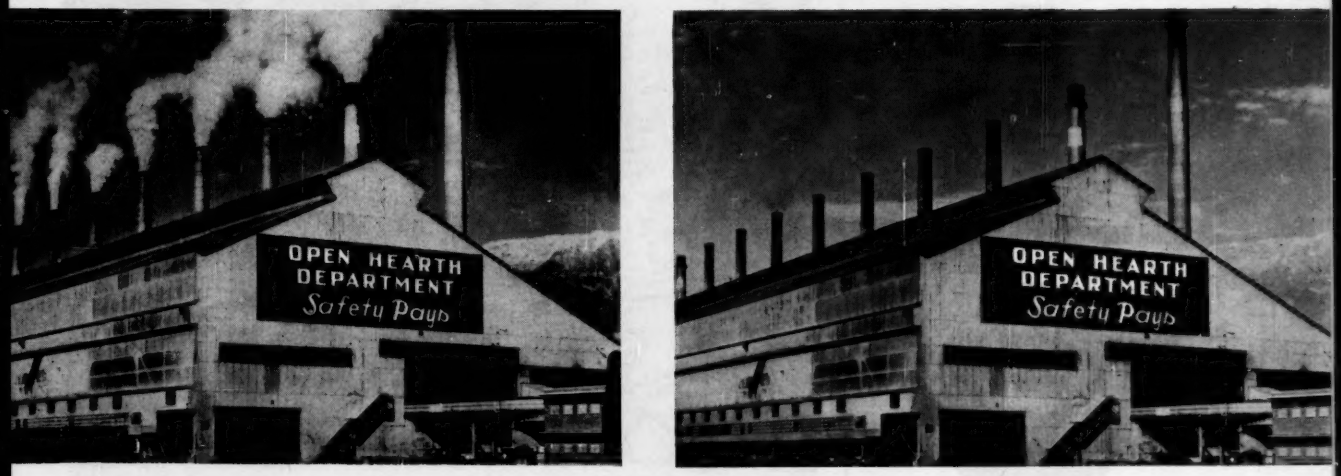
A SALES DIVISION OF

GENERAL ANILINE & FILM CORPORATION

435 HUDSON STREET • NEW YORK 14, NEW YORK

SALES OFFICES: New York • Providence • Philadelphia • Charlotte • Chattanooga • Chicago • Portland, Ore. • San Francisco • Los Angeles. IN CANADA: Chemical Developments of Canada, Ltd., Montreal

Igepon, manufactured by General Aniline & Film Corporation, is sold outside the United States under the trade name "Tenopon."



Before (left) and after (right) installations of U.S. Steel's $9-million pollution control system.

New Twist in Air Pollution Control

Country living and city living have one thing in common as far as industry is concerned—air pollution problems. And this week, U.S. Steel reveals details of a project that shows how tough a country problem can be.

At its Columbia-Geneva mill, nestled in fertile Utah Valley of the Wasatch Mountains, near Provo, USS has been forced to lay out $9 million for air pollution control. A complicated—as well as expensive—example of how chemical engineering techniques are put to use for pollution control, the project took seven years to evolve.

Visual evidence of what the project has accomplished: "before and after" looks at the mill's stacks (*photos, above*). But that only hints at the real accomplishment—elimination of crop- and cattle-damaging fluorine as an air pollutant. The effectiveness of the Geneva works' measures—as proved by a Stanford Research Institute-Utah State University probe—helped USS win its legal battle over damaged-stock claims (*CW Business Newsletter, Oct. 26*). Up to the time USS put the control system into operation and stopped paying a regular damage fee to local farmers and cattlemen, voluntary claim settlements had topped the $4-million mark.

Precipitators Plus: Heart of the control project is what the Geneva works touts as the largest electrostatic precipitation system in the world—it handles 1 million cu.ft./minute of open-hearth gases at 600 F, and 340,000 cu.ft./minute of sinter-bed gases at about 800 F. The precipitators remove about 13,700 lbs. of fluorine (in the form of 20 tons of calcium fluoride) daily. Fluorine recovery runs about 96%.

But it takes a tricky bit of chemical engineering know-how to get the electrostatic precipitators to collect the fluorine in the waste gases. Here's how chemical engineers at the Geneva works do it:

Essentially, the gaseous fluorine in the sinter-plant and open-hearth waste gases is converted into calcium-fluoride solids by injection of calcium hydrates and carbonates (*CW Technology Newsletter, Nov. 30*). Cyclones remove a large amount of the resultant calcium-fluoride dust, prevent visible smoke from the stacks, reduce the load on the electrostatic precipitators, which are the final purification step.

The engineers, incidentally, ran into a temporary snag at the precipitators, found that an electrostatic charge couldn't be created with dry dust. They hit upon the idea of injecting steam into the gas collector mains (e.g., 2.4-million lbs./day of steam from the waste-heat boilers is used in the open-hearth collector main) to attain a humidity of 20% in the waste gas and create the moist calcium fluoride needed to generate the electrostatic charge.

Two Plants, Two Methods: The methods of lime addition are different at the two Geneva works' plants (sinter plant and open hearths), are dictated by economics and type of plant operation.

At the sinter plant, fluorine conversion is a two-step operation. First, limestone (calcium carbonate) is charged to the sinter bed, reducing emissions about 50%. The second step is dry-dust injection at two points in the gas collector mains—calcium hydrates are added before cycloning; calcium carbonates are added after cycloning. Calcium carbonate is cheaper than the hydrates, but it is coarser and would increase fan and cyclone wear if injected into the collector mains before cycloning. Hydrate addition before cycloning gives maximum lime-fluorine contact time, improves recovery.

At the open hearths, where fluorine concentration is affected by the use of fluorspar (natural calcium fluoride) as a flux, limestone can't be charged effectively. Dry-dust injection of calcium hydrates at the gas collector main is the only technique that gives effective recovery.

Started from Scratch: The Geneva works was built by the federal government during the early days of World War II. It was not until '50 that USS

Cars, drums, cans . . .
Diamond's Chlorinated
Solvents arrive on time

METHYLENE CHLORIDE
(Dichloromethane)
Practically nonflammable

METHYL CHLORIDE
(Monochloromethane)
Resists oxidation
Thermal stability

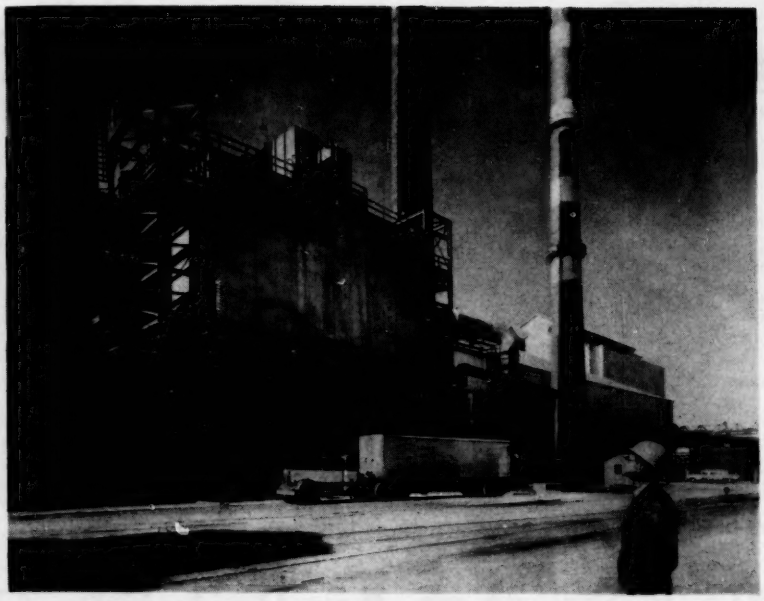
CHLOROFORM
Technical grade
or U.S.P. grade

CARBON TETRACHLORIDE
Also fire extinguisher fluids, grain fumigants and custom blends

PERCHLORETHYLENE
For drycleaning and metal degreasing

Phone your DIAMOND Representative or write DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio

Diamond Chemicals



Twin precipitators are set between open-hearth stacks.

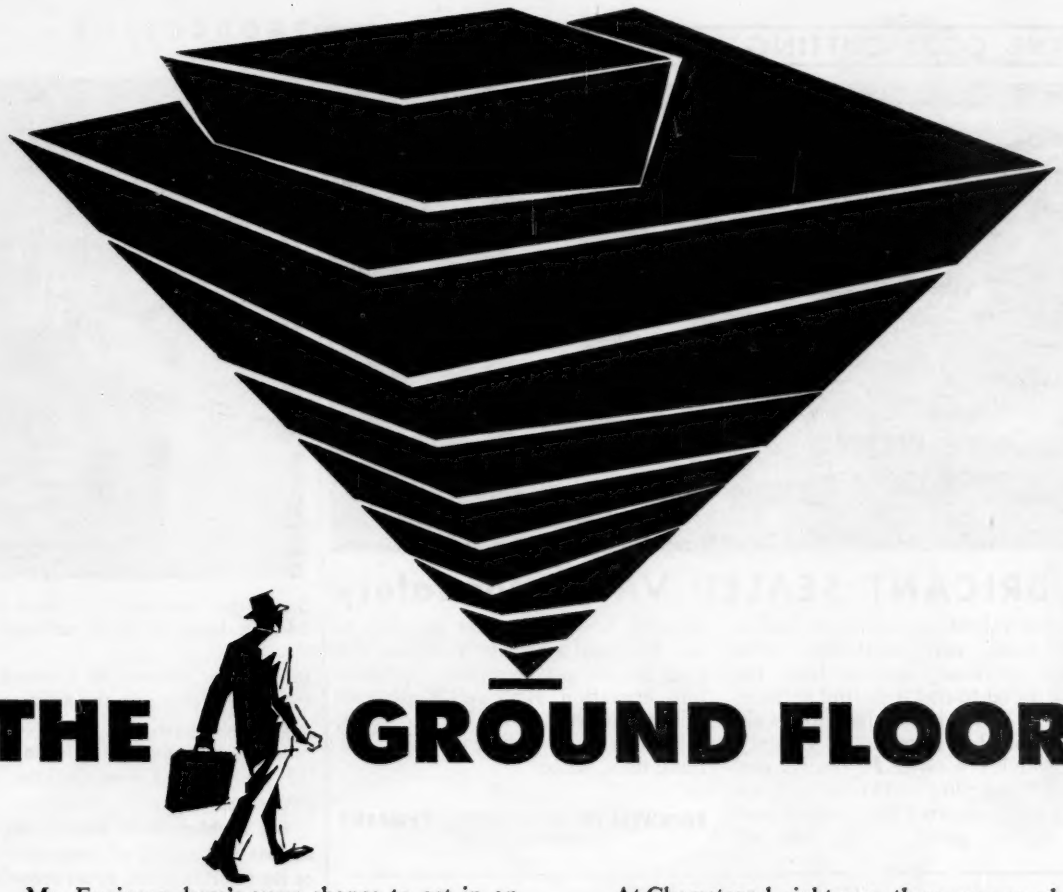
began to learn that its use of high-fluoride ores were causing pollution problems. Warning sign was suspected fluorosis in cattle in the area that had consumed the fluorine when they ate grass.*

USS could find no previous history of high-fluorine emissions in steel plants or other industrial and chemical plants, had to work out its solution from scratch. Other industrial installations captured fluorides in scrubbers. The Geneva works tried this approach in a pilot plant, found that the hydrofluoric acid created by the washing process caused complete destruction of the units "in a matter of days."

While tests were being conducted, the firm made voluntary payments to

*Fluorosis affects young stock, causes marls, bumps; theoretically, it could become sufficiently bad to impair mastication and affect milk production.

Entire pollution control system is monitored from master panel.



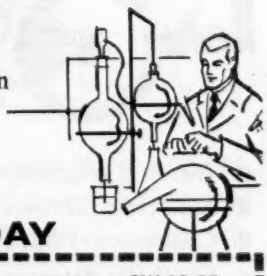
THE GROUND FLOOR

Mr. Engineer, here's your chance to get in on the "ground floor" with a company that has grown to leadership in just five short years.

Already in its sixth major expansion in five operating years, Chemstrand's greatest growth still lies ahead! Our company's field of chemical-textile fibers is young . . . but growing rapidly. Our industry calls for an 8-fold increase by 1975!

At Chemstrand, right now, there are a number of creative engineering projects just waiting for capable men to put them into action. The men who join us today will be the experienced, sought-after "pioneers" of tomorrow.

We are asking *you* to join us . . . on the "ground floor" at Chemstrand!



WRITE TODAY

TECHNICAL PERSONNEL MANAGER, Dept. CW-12-57
The Chemstrand Corporation, Decatur, Alabama

Gentlemen:
It is my understanding that you need for immediate employment graduate engineers in various fields, particularly chemical, mechanical, industrial, textile and instrument engineering.
I am a graduate_____engineer.
Please send me information concerning the ground floor opportunities at Chemstrand.

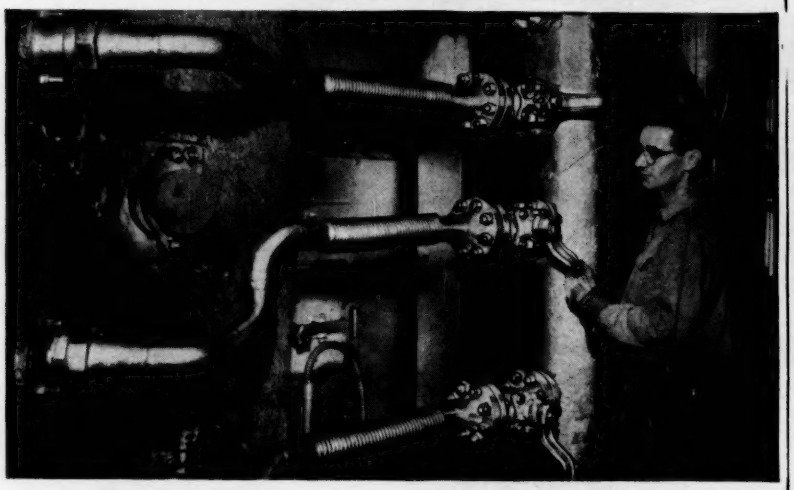
NAME_____
STREET_____
CITY_____ ZONE____ STATE_____

CHEMSTRAND

THE CHEMSTRAND CORPORATION, DECATUR, ALABAMA

TOMORROW'S BIG DECISIONS WILL BE MADE **by the men who act today...**

THE COST CUTTING SERIES . . .



LUBRICANT SEALED VALVE for safety

Leaking valves, especially on fuel or toxic lines, can jeopardize plant safety. Ordinary valves leak because metal-to-metal closing surfaces scratch and erode. In Rockwell-Nordstrom lubricated plug valves a thin, tough *pressurized lubricant* seal between the plug and valve body assures safe, leakproof flow control over the lightest gases or the heaviest slurries. Seats are *never* exposed to line fluid and lubricant "cushions" the plug for instant emergency quarter-turn operation. Rockwell-Nordstrom lubricated plug valves cost no more, often less, than ordinary valves. For more data, write:

ROCKWELL MANUFACTURING COMPANY
PITTSBURGH 8, PA.

RC COMONOMERS

Unsaturated diesters of high purity available in commercial quantities for use as...

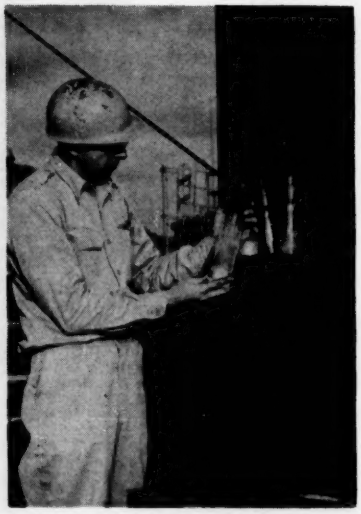
* *Internal plasticizers for polyvinyl acetate*
* *Synthetic lubricants and oil additives*
* *Comonomers in polymerization reactions*
* *Synthetic detergent intermediates*

DIOF Di-iso-octyl Fumarate	DIOM Di-iso-octyl Maleate
DOF Di-2-ethyl hexyl Fumarate	DOM Di-2-ethyl hexyl Maleate
DBF Dibutyl Fumarate	DBM Dibutyl Maleate

Special comonomers available on request

WRITE FOR SAMPLES! We'll send you a brochure on all RC products that can speed your operations, improve your products.

RUBBER CORPORATION OF AMERICA
Ready . . . reliable . . . RC serving American industry, since 1930.
New South Road, Hicksville 5. N. Y.
Sales Offices: NEW YORK • AKRON • CHICAGO • BOSTON



Stack gas samples are taken on a 24-hour basis to check efficiency.

farmers for damage to livestock. By the time it hit upon the solution and placed contracts with Research Cottrell, Inc., as prime contractor in March '53, the project had reached the "urgent" stage.

Big Problem Left: Still on the USS agenda is a means of commercial use of the fluoride waste, or an economical method of recapturing the fluorine values. Now, the waste is collected, agglomerated to prevent it from being blown away, hauled to the nearby slag heaps. But this problem has little of the urgency of the original air pollution.

Cow's teeth are photographed as part of fluoride-check program.

You get *best rust protection* from

There's more zinc phosphate on every rust-inhibited US Steel container—both inside and out. This extra protection gets your product to your customers cleaner, and keeps it that way longer, because US Steel's extra thickness of zinc phosphate guards against rust *even after the container is open.*

Profit from these 5 US Steel extras, too:

- **Widest container variety**—from 2½-gal. pails to 55-gal. drums, including stainless.
- **Eye-catching containers** — your containers not only ship your product, but advertise it, too — when color-decorated by US Steel.
- **Job-tailored fittings** — a wide selection of fittings to choose from, others available to order.
- **Prompt container delivery** — a 7-point factory system gives you next-door service anywhere — any time.
- **Longer container life**—extra rust protection allows more safe refillings per container.

UNITED STATES STEEL PRODUCTS

DIVISION

UNITED STATES STEEL CORPORATION

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.

Los Angeles and Alameda, Calif. • Port Arthur, Texas
Chicago, Ill. • New Orleans, La. • Sharon, Pa. • Camden, N. J.

USS STEEL DRUMS

UNITED STATES STEEL

Pennsalt Chemicals Corporation—a leading supplier of both organic and inorganic chemicals for more than 100 years—is now producing, in high-volume continuous processes, 'Sharples' brand synthetic Organosulfur chemicals directly from unlimited basic mineral sources.

These new petrochemical "building blocks", synthesized from elemental sulfur, natural gas and petroleum, are: Methyl Mercaptan, Ethyl Mercaptan, n-Butyl Mercaptan, n-Octyl Mercaptan, Tertiary Dodecyl Mercaptan, Thiophene and Ethylmercaptoethanol.

Investigate the 'Sharples' brand synthetic Organosulfur chemicals for better starting points and pathways to new intermediates and improved products. Call your nearest Pennsalt district office or write to Pennsalt direct.

Pennsalt Chemicals

INDUSTRIAL DIVISION
PENNSALT CHEMICALS CORPORATION
3 Penn Center, Philadelphia 2, Pa.
Regional Offices: Chicago • Detroit • New York • Philadelphia • Pittsburgh • St. Louis
Representatives: Martin Hoyt & Milne, San Francisco and Los Angeles
Airco Company International, New York • Pennsalt Chemicals of Canada Ltd., Hamilton, Ontario

Technology
Newsletter

CHEMICAL WEEK
December 14, 1957

New method of separating uranium-235 won for Erwin Becker, of Marburg University, the Dechema prize (awarded annually by the German Society for Chemical Engineering for the research project of greatest economic significance). The process employs a unique jet-separation technique *(trenndüsenverfahren)* soon to be tested in a pilot plant now being built at Marburg.

Becker's method makes use of the difference in molecular weights of uranium hexafluoride isotopes. The lighter (U-235) UF_6 isotopes are peeled from a stream of mixed UF_6 as it passes through a vacuum chamber. In principle, the separation is accomplished by passing the mixed hexafluorides through a small nozzle (0.1 mm. in diameter) at ultrasonic speed, catching the stream of heavier U-238 particles in an adjacent stripper opening. The lighter particles pass by the opening, are recovered separately from the vacuum chamber.

Equipment for the pilot plant will include 10 jet-separation sets, each set consisting of two six-sided tubes, slotted along two sides to act as nozzles, spaced between three similar stripper-tubes with corresponding slots. Each set will be installed in a vacuum chamber; UF_6 will be supplied at supersonic speed by special corrosion-resistant Roots blowers.

Though the jet-separation process can't be compared to the large-scale gaseous diffusion processes employed in the U.S., Becker predicts that his method will be cheaper and simpler to operate. Estimated energy requirement for jet-separation: 8,800 kwh./kilogram of natural uranium.

•

Continuous digestion should soon get a bigger play by the U.S. pulp and paper industry. That's what Walter Holzer, Crown Zellerbach's manager of technical projects, told a San Francisco area Technical Assn. of the Pulp and Paper Industry (TAPPI) meeting last week. Holzer has just returned from a two-month inspection of European papermaking facilities.

Difficulties with the process—mechanical troubles during start-up, production of a poorer grade of material than that made by the batch process—have been overcome, he says. He added that Kamyr, the Swedish firm that developed and makes the continuous digester, reports 20 units have been installed throughout the world, and it has orders for 19 more. A handful of the installations are in the U.S. and Canada.

•

Polypropylene articles were on display by at least two exhibitors at last week's Exposition of Chemical Industries in New York. Montecatini, of course, had the splashiest display of polypropylene articles (*CW Technology Newsletter, Dec. 7*).

Nalge Co., Inc. (Rochester, N.Y.), had some beakers and other laboratory equipment injection-molded of polypropylene. Some of it was Hercules' material, but some was supplied by a different, unidentified U.S. company (probably Jersey Standard). Nalge reports it was on the verge of going into production of some fluorocarbon products, found it could get many of the desired properties in polypropylene, and much cheaper. Samples of Hercules' product were yellowish in color, due to the stabilizer. But Nalge emphasizes that these were early lots and that the product it is working with now has no off-color. It has about a ton of polypropylene on hand.

•

Tennessee Eastman's acetylene-from-natural-gas process was one of the highlights this week at the annual AIChE meeting in The Conrad Hilton Hotel in Chicago. Describing its year-long operation of 1-million-lbs./year experimental furnaces, TE reported yields of acetylene and ethylene ranging up to 56% (by weight) from propane, to 58% from natural gasoline. The process: a version of the Hasche process (*CW Technology Newsletter, July 13*), in which the cracking stock is mixed directly with combustion products of a fuel gas-oxygen or fuel gas-air flame.

•

Nonskid chemicals for railroad tracks came up in the American Society of Mechanical Engineers' meeting in New York last week. Among the papers on the subject was one dealing with Nalco RC, developed by the Reading Co., General Electric, and National Aluminate (*CW Technology Newsletter, Dec. 22*). Results of the first year's tests showed the improved traction it provided would permit Reading to run 14% fewer trains, 4.7% fewer locomotive units to carry the same tonnage. But the Reading group warns that the cost of applying the antiskid compound must be weighed against the load-carrying improvements. The report, incidentally, confirmed the previously held belief (*CW Technology Newsletter, April 6*) that the chemical being tested is a colloidal suspension of silica with solvents.

•

A new wax-lead material for radiation-shielding of nuclear reactors will be placed on the market by California Ink Co. (San Francisco). The company revealed its plans at the dedication of its $400,000 research lab at Berkeley Dec. 6.

Prime advantage of the new material is that it will enable reduction in thickness and weight over conventional lead-concrete shielding, with a consequent cost savings. Developed by the Atomic Energy Commission's Livermore, Calif., radiation lab, it is a suspension of finely divided lead particles in paraffin wax. California Ink polished a process for making it on a commercial scale. The big trick: finding how to keep the lead particles in suspension.

PROOF that Fortified DYLEX® K-52 gives coated paper outstanding pick resistance!

THE PIGMENT BINDING STRENGTH of new DYLEX K-52—a *Fortified* styrene butadiene latex made by Koppers—was tested on this I. G. T. Printability Tester. The paper strip was a standard letterpress stock coated with DYLEX K-52. A #3 tack-grade ink was used; and the test was run at a speed equivalent to a press speed of 640 fpm.

The results speak for themselves. There isn't a sign of picking on the sample. The ink did not affect the coating; it printed smoothly and evenly. Other latices picked severely when subjected to the same test.

In addition to superior resistance to picking, new DYLEX K-52 produces coating colors with good adhesion and flow properties because of its fine particle size. It is compatible with starch, dextrin and protein adhesives commonly used. It may be used with a variety of pigments on all types of coaters.

Write for complete technical information and a test sample of new Fortified DYLEX K-52. Koppers Company, Inc., Chemical Division, Dept. CW-127, Pittsburgh 19, Pa.

KOPPERS

KOPPERS CHEMICALS

Offices in Principal Cities • In Canada: Dominion Anilines and Chemicals Ltd., Toronto, Ontario

MERCHANTS LOCATES RARE CHEMICAL FOR BUSY CUSTOMER

helps put research project on production line

RESEARCH LAB of small midwestern company needs unusual chemical, and purchasing agent tries to locate source. Regular suppliers don't stock it—most of them never even heard of it. A promising research program seems stymied.

ON A HUNCH, P.A. PHONES MERCHANTS' sales office in Cincinnati, says he knows they don't distribute the chemical, but can they help out? His call sets Merchants' unique nationwide buying service in action, combing all possible sources.

WITHIN DAYS manufacturer is located and small shipment is rushed to Merchants' warehouse. Merchants' own truck makes delivery and research operation is shortly converted to production program.

Saving time and money for purchasing agents is part of the service offered by Merchants—distributors of heavy chemicals and specialties. It could be a situation like the one above, or getting chemicals from widely separated sources, or meeting special requirements in packaging.

Whatever the need, Merchants is geared to serve you. A chain of sales offices and warehouses across the country offers the advantages of nationwide service with the economies of local delivery.

Merchants can often reduce your shipping costs, simplify your ordering, cut down your office paperwork.

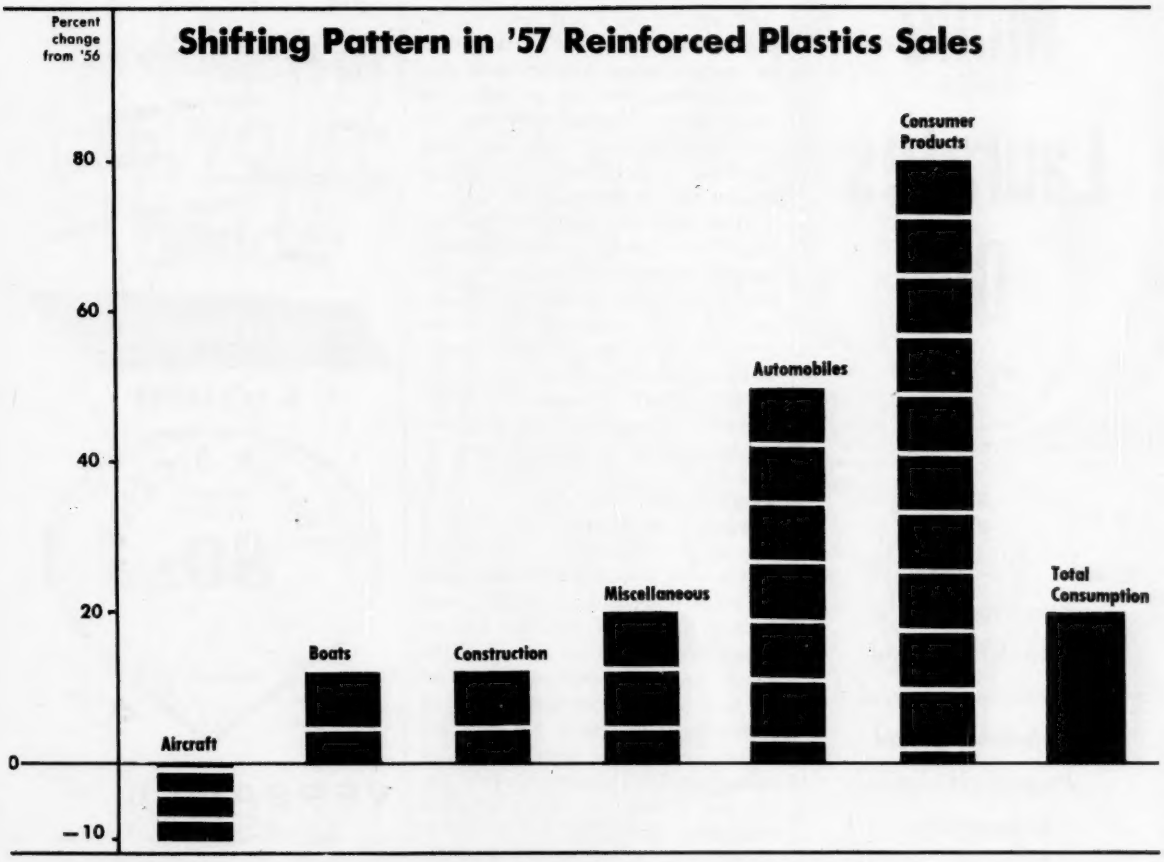
Products include acids, alkalis, fungicides, surfactants, chlorinated solvents, emulsifiers, laundry compounds, soaps, dry ice and chemical specialties.

SERVICE QUALITY MERCO

MERCHANTS CHEMICAL COMPANY, INC.

60 East 42nd Street, New York 17, N. Y.

SALES OFFICES AND WAREHOUSES: Chicago • Cincinnati • Columbus • Denver • Louisville • Milwaukee • Minneapolis • New York • Omaha
STOCK POINTS: Albuquerque, N. M. • Erwin, Tenn. • S. Norwalk, Conn.



Reinforced-Plastics Sales Pace Slackens

U.S. reinforced-plastics makers aren't known for conservative business forecasting. On the contrary, their perennial optimism in past years has led to predictions far in excess of attainments. And this week, it is reasonably certain that '57 will be no exception. Industry experts' earlier forecast of a 30% hike in reinforced-plastics sales towers about one-third higher than the actual—though healthy—20% boost over '56 sales.

Final industry statistics on '57 reinforced-plastics sales won't, of course, be forthcoming until next month. But available U.S. Tariff Commission data on polyester resin production points with reasonable certainty to smaller-than-expected consumption of reinforced materials in '57, although it's not a completely accurate measure.

Polyester resin production in the first nine months of '57 amounted to about 70 million lbs., and the total for the year may run about 93 million lbs. By comparison, polyester output for all of '56 was a little more than 79 million lbs.

Most U.S.-produced polyester resin is, of course, used to make reinforced plastics; and although other resins (i.e., epoxies, low-pressure phenolics, polystyrenes, silicones, melamines, vinyls) are also used, they comprise but a minor part of total reinforced-plastics output.

Hence, total U.S. polyester production reflects fairly well the probable order of magnitude of reinforced-plastics demand. A raw materials production increase of 18% thus indicates a no greater than 20% boost of reinforced-plastics sales this year. This, incidentally, checks well with a preliminary report last month from the Society of the Plastics Industry. SPI's annual survey of the reinforced-plastics market, indicated '57 U.S. consumption of about 168 million lbs. —about 20% more than the 140 million lbs. reported for '56.

Although enthusiastic industry observers' predictions for '57 now seem almost inexplicably optimistic, these prognosticators felt at the time they made their predictions that they were being conservative. For '56, they had foreseen 50% growth over '55, but actual growth was 30%; so, for '57, they relied on a seemingly safe rule of thumb—"next year will be as good as this year"—in predicting the not-to-be-achieved 30% sales increase.

That the actual total sales in '57 was again smaller than expected supports the view that the reinforced-plastics industry is about past its initial growth surge and is settling down to a growth rate more closely

Mono
Laurates
Di

of
Diglycol
Ethylene Glycol
Diethylene Glycol
Polyethylene Glycol
Propylene Glycol
Polyoxyethylene
Butoxyethyl
Glycerine

MADE TO MEET YOUR SPECIFICATIONS

THE FLAME AND THE FLASK—SYMBOL OF QUALITY

The C. P. Hall Co.
CHEMICAL MANUFACTURERS
5147 W. 67th Street, Chicago 38, Illinois
AKRON, OHIO • NEWARK, N. J.
CHICAGO, ILL. • LOS ANGELES, CAL.

MARKETS

keyed to general business conditions.

Next Year's Look: What's the outlook for '58? It's a real poser for the experts—perhaps more so now than in previous years. Reason: most current business forecasts are based on the generally accepted view that '58 will be a "plateau" year, and sales increases in most industries will be smaller than in recent years.

How much this moderated business tempo will affect the reinforced-plastics industry depends, of course, on the degree to which its various consuming industries are affected by the ups and downs of the over-all national economy. Here's a close look at the industries that consume the larger share of reinforced-plastics output—the background of their '56 and '57 performances, and some estimates of what's to come next year:

Boats, Slow Ahead: Less than a year ago, U.S. boatbuilders had reason to view the future with considerable optimism (*CW, Feb. 2, p. 80*), were happily forecasting that the rate of plastic boat output by '60 would be about 100,000 units/year. And on the basis of a 40,000-unit turnout of plastic boats in '56—a big 30% increase over '55—a jump of 10,000 units/year (20%) seemed likely for '57. But chances are that when final production figures are in, total U.S. plastic boat output in '57 will still be shy of the 50,000-unit level.

Consumption of reinforced plastics for boatmaking, according to industry estimates, was about 22 million lbs. in '56; the likely 10-15% increase this year probably boosted '57 consumption about 3 million lbs.

And for '58, boat sales will, at best, increase another 10-15%—especially if the business "plateau" period becomes a "mild recession," as many of the nation's economists fear. Any noticeable recession could, of course, be a significant sales-dampener of '58 boat sales, since boats are relatively high-priced luxury items and would be first to go from many budgets.

But it's all a matter of degree, and conservative forecasts still point to a healthy growth of the plastic boat market in '58. Even if over-all boat sales should lag, reinforced-plastics marketers may fare well, because many boatmakers are reportedly shifting from orthodox boatbuilding materials to the use of plastics.

Auto Acceptance: The Society of

VERSATILE

Recommended for its properties as a reducing agent, preservative, antichlor and pH control.

PRACTICALLY 100% PURE

Efficient and economical—this versatile chemical is used in various production processes—Tennessee's high purity liquid Sulfur Dioxide can no doubt be utilized to an advantage in your processing.

We would like to discuss with you the advantages to be realized from the use of this versatile product in your processing.

Liquid SULFUR DIOXIDE HIGHEST QUALITY SO2

AVAILABLE IN:
• Cylinders • Ton Drums
• Tank Trucks • Tank Cars

TC TENNESSEE CORPORATION

TENNESSEE CORPORATION
617-629 Grant Building, Atlanta, Ga.

We fit our production to YOUR needs

Our specialty is making white oils, petrolatums and petroleum sulfonates to fit specific needs. Since we've been doing this for more than half a century, we know how to make these products exactly the way our customers want them.

Chances are, there's a white oil, a petrolatum or a petroleum sulfonate among the many types and grades in our regular line that will be just right for your purpose. But if there isn't, we'll tailor-make one for you.

No matter what your problem may be, you may be sure we shall fit our production to your needs!

L. SONNEBORN SONS, INC.
New York 10, N. Y.

A Product of **Sonneborn** RESEARCH

White Oil, Petrolatum & Sulfonate Div.
L. SONNEBORN SONS, INC., Dept. CW 12
300 Fourth Avenue, New York 10, N. Y.

Gentlemen:

Will you please send me Technical Data on the following:

☐ White Mineral Oils ☐ Petrolatums ☐ Petroleum Sulfonates

What can you do to help me solve this problem?

_____

_____

Name.....

Company.....

Address.....

City.....**Zone**.....**State**.....

NOW

JEFFERSON LAKE

brings you

LIQUID SULPHUR

in our own

TANK CARS

Jefferson Lake is the first major sulphur producer to ship molten sulphur in its own tank cars. This is your assurance of sulphur delivered at its *purest*—with absolutely no contamination. Economical molten shipments eliminate all "dusting" losses, too.

Our fleet of specially designed and insulated tank cars stands ready to move your order. You can rely on Jefferson Lake's many years of experience with tank car shipments for fast, convenient delivery *anywhere.*

Send for our illustrated brochure describing proper unloading and handling procedures for this new low-cost means of sulphur transport.

PURITY 99½% +

JEFFERSON LAKE SULPHUR COMPANY

DOMESTIC SALES OFFICES

Prudential Bldg., Houston 25, Texas • Tel. JAckson 6-2811

MARKETS

Plastic Industry's preliminary reinforced-plastics report also indicates that about 16.8 million lbs. of these materials—representing 10% of total U.S. consumption—went into automotive uses in '57 (*CW, Nov. 9, p. 82*).

The 16.8 million lbs. figure is about 5.6 million lbs. higher than the comparable figure for '56, when about 8% of the total 140 million lbs. of the U.S. reinforced-plastics market went into comparable uses by the auto industry.

Trade observers point out, however, that the SPI surveys probably cover only about half the total volume of reinforced plastics used by the auto industry, because premixes for molding are not included.

Other Growth Areas: Fields of reinforced-plastics application that industry observers in '56 check-marked for significant sales increases during '57 were: transportation (including passenger cars and trucks, airplanes, boats and railcars), household appliances, furniture and seating, containers, construction and electrical components.

In most cases, the subsequent '57 sales pattern justified the bright outlook in its qualitative aspects, if not entirely quantitatively accurate. Biggest percentage sales gains were racked up by the automotive and consumer products categories—in auto uses because of stepped-up plastic designing of large auto body parts as well as of smaller accessories, and in consumer products because of mushrooming new applications and steady growth of established products.

Aircraft Grounded: That aircraft and missile demand for reinforced plastics in '57 dropped off* instead of increasing along with requirements of other transportation markets comes as no surprise in light of numerous post-Sputnik revelations about lagging U.S. aircraft and missile development. But losses could be translated into gains by an all-out drive to up aircraft and missile output. As indicated by a West Coast spot-check of aircraft manufacturers by the Society of the Plastics Industry, the field of structural and semistructural aircraft components is "ripe for invasion and development" by the plastics industry.

Costs Decline: A number of factors contributing to cost savings accelerate

*As much as 10%, according to some industry experts.

the acceptance of reinforced plastics by many fabricating industries. Average cost of polyester resin, for example, has dropped 22.2% in the past eight years (from 45¢/lb. in '49 to 35¢/lb. in '57), and cost of mat reinforcement has declined 13.3% (from 60¢/lb. to 52¢/lb.).

Other areas of savings: development of less-expensive forms of reinforced plastics to meet specific consumer needs; development of faster and less-expensive methods of producing both the plastic materials and their fabricated products—for example, in a new spray gun—in which all the components of a reinforced-plastics material (i.e., plastic resin, reinforcement material, filler, catalyst) can be applied simultaneously.

It's obvious that the reinforced-plastics business is a healthy "growth industry." But its marketers will now have to adjust their thinking to the fact that the industry's "remarkable steady growth of 30%/year" will no longer be an inevitable aspect of its sales record.

Syndets Higher

Synthetic detergents continue to slice out a larger share of the total U.S. cleanser market. Latest statistics, result of the quarterly sales census of 72 manufacturers by Assn. of American Soap and Glycerine Producers, show that syndet sales for the first nine months of '57 represent 70.7% of the total market, tonnage-wise, and 68% in dollar value.

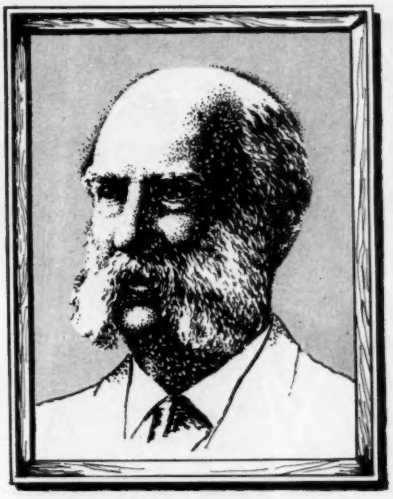
Tonnage sales of synthetic detergents (solids and liquids) have climbed 7.8% above those in the comparable nine-month period of '56, while solid and liquid soap sales are off 7%. Pounds for Jan.-Sept. '57: syndets, a little under 2.25 billion; soaps, a shade more than 920 million lbs. Dollar sales: syndets, nearly $519 million—12.7% ahead of last year; soap, approximately $242 million—nearly equal to sales in the first nine months of '56.

Total sales of synthetic detergents and soaps in the three quarters set a new nine-month record, says the association, topping the '56 all-time high 3% in tons and 8.4% in dollar value. The '57 combined figure was 3,145,194,000 lbs. (worth $760,881,000) vs. 3,053,796,000 lbs. (valued at $702,203,000) last year.

Excerpts From The Chemical Hall of FAME

James Mason Crafts

(1839-1917)



In 1911 Crafts was awarded the Rumford medal by the American Academy of Arts and Sciences for his investigations into thermometry that were so accurate they are still regarded as classic.

By 1911 Foremost's El Dorado Division had been stressing purity and uniformity in their production control for nearly two decades.

FOREMOST EL DORADO DIVISION

FATTY | **A**CIDS | **M**ETHYL | **E**STERS

OF COCONUT OIL

Fatty Acids Caprylic Eldhyco* Capric Lauric Coconut Palmitic Myristic

Methyl Esters Caprylate Eldo 18* Caprate Laurate Coconate Myristate Caproate Palmitate

*T.M. Reg.

For Example: **ELDO CAPRIC ACID**

94-97% pure. (Purest Capric Acid commercially produced.) Readily available at an attractive price. Eldo's high standards give you a better, more uniform end product.

For samples and specifications, write Dept. W.

FOREMOST FOOD AND CHEMICAL COMPANY

P. O. Box 599, Oakland 4, Calif.

FOREMOST EL DORADO DIVISION

In New York: H. Reisman Corp.
In Detroit: Harry Holland & Son, Inc.
In Chicago: M. B. Sweet Co.
In Cincinnati: Howard Dock
In Cleveland: F. W. Kamin Co.
In Minneapolis: M. H. Baker & Co.
In Boston: N. S. Wilson & Sons

HOW THE SILICONES MAN HELPED
BUILD THE PATTERN OF A TIRE TRY
HOW THE SILICONES MAN HELPED...
Stop Costly Water Damage In
HOW THE SILICONES MAN HELPED...
Deliver a Hot Blast to Cold Jets!
HOW THE SILICONES MAN HELPED...
Light up the life of a double-decked commuter
UNION CARBIDE
SILICONES

HAVE YOU MET THE

SILICONES MAN?

He'll tell you the story of the "impossible" rubber that helps deliver a hot blast to cold jets . . . or the case of the 3600 mph wind tunnel. Perhaps you'll want him to tell how he helped seal a delicate gyroscope . . . or show you the brick that floats. Here's a man with a thousand success stories about UNION CARBIDE Silicones.

But the Silicones Man is in reality many men—in sales engineering, technical service, research, and development—all working together as the Silicones Division of UNION CARBIDE. Between them they possess tremendous knowledge about the wonderful world of silicones. There's a Silicones Man in most major cities. Put him to work on your problems today. For a complete description of many silicone products, write for the booklet "Look to UNION CARBIDE for Silicones," Dept. L-14, Silicones Division, Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

UNION CARBIDE TRADE-MARK SILICONES

The term "Union Carbide" is a registered trade-mark of UCC.
In Canada: Bakelite Company, Division of Union Carbide Canada Limited, Toronto 7, Ontario

Market Newsletter

CHEMICAL WEEK
December 14, 1957

Many price hikes are being posted these days, but not all are sticking. Latest to backtrack are tags on tetraethyl lead, the prime gasoline anti-knock additive. Du Pont late last week reduced prices on its compounds about ½¢/lb., explained it was "passing along operating economies." The new prices, however, are similar to those in effect prior to advances made earlier this year (*CW Market Newsletter, March 9*) because of "higher production costs."

Domestic price of the firm's Motor Mix is back to 37¢/lb. (down from 37.92¢/lb.); Motor Mix A now costs 36.58¢/lb.; and aviation mix compound is reduced to 40.58¢ (from the previous 41½¢/lb.).

TEL competition being what it is, Du Pont's announcement was followed, within hours, by similar word from Ethyl Corp., the other major producer. Ethyl's prices, although actually comparable to Du Pont's, are quoted on TEL content rather than on an antiknock compound basis. New prices: 60.18¢/lb. for Motor Mix; 61.18¢ for Motor Plus; 66.08¢/lb. for aviation mix.

Lead and lead oxide prices were also chipped ½¢/lb. last week. The move, by smelters and producers, continues the downslide that has brought the metal's price down a full 3½¢/lb. over the past 23 months. The latest reduction followed further weakness in London Metals Exchange lead values.

Same reasons that applied to an earlier U.S. decline (*CW Market Newsletter, Oct. 26*) are said to be behind last week's cut—a hoped-for added block to low-cost imports; added emphasis to domestic industry pleas for greater tariff protection.

The lead metal tumble also sparked an additional ½¢/lb. cut in the prices of oxide. Lower c.l. tags: on 95% dry red lead, 15¼¢/lb.; litharge, 14¾¢; orange mineral, 17.6¢/lb. Prices on l.c.l. quantities are down proportionally.

Worldwide copper output may be trimmed to ease the global oversupply that has played havoc with the metal's price during the last year and a half or so. Meetings being held in London (involving three large African producers and a representative of Chile's Copper Dept.) reportedly are surveying world copper production and its impact on prices.

U.S. producers have been curtailing output, but other countries —particularly Chile, which has an economy heavily dependent on the metal it exports—have been reluctant to cut back. (The African group and Chile last year accounted for more than a third of the 3.3 million tons of copper produced by non-Communist nations.)

Trade followers here believe that it will be some time before any conclusions are reached at the London conferences, but consensus is

that orderly curtailment would bring supply more in line with current demand.

Several pigment prices will be lower come Jan. 1. American Cyanamid posted notice of reductions on a long line of items that includes para toners, the lithols (barium, sodium, calcium) and alkali blue toners. The cuts are substantial: on the blue toners, for example, new prices will range from $1.20-1.28/lb. (depending on quantity), compared with current prices of $1.28-1.36.

•

Two regional notes on an expansion and a cutback:

• On the West Coast, more boric acid and by-product anhydrous sodium sulfate is being produced. Stauffer has just completed an expansion of its San Francisco boric acid facilities that will boost capacity by 50%. Cost of the addition: $500,000.

• A 50% cutback in a military aviation gasoline contract is the reason Cosden Petroleum will close down its Hawley, Tex., refinery within 30 days. Part of the Hawley plant personnel will be absorbed by the firm's Big Spring refinery.

•

Spread between U.S. and Mexican sulfur prices was narrowed last week-end when Mexican sellers hiked their prices $1/ton. New quotes: $24/ton for filtered sulfur, $23/ton for dark material—both f.o.b. Coatzacoalcos, Mex. The move brings Mexican prices a little closer to current U.S. export tags of $25/ton for bright sulfur, $24/ton for dark (f.o.b. Gulfport.)

The Mexican advance underscores the report (*CW Market Newsletter, Oct. 27*) that no U.S.-Mexican price war was in the offing, despite some trade speculation to the contrary. Apparently, Mexican sellers agree that further cuts would only mean lower company earnings, would contribute not a whit to a pickup in sulfur sales.

It's still too early to tell, of course, but slicing the differential could point the way to greater worldwide sulfur price stability. At any rate, producers on both sides of the border hope so.

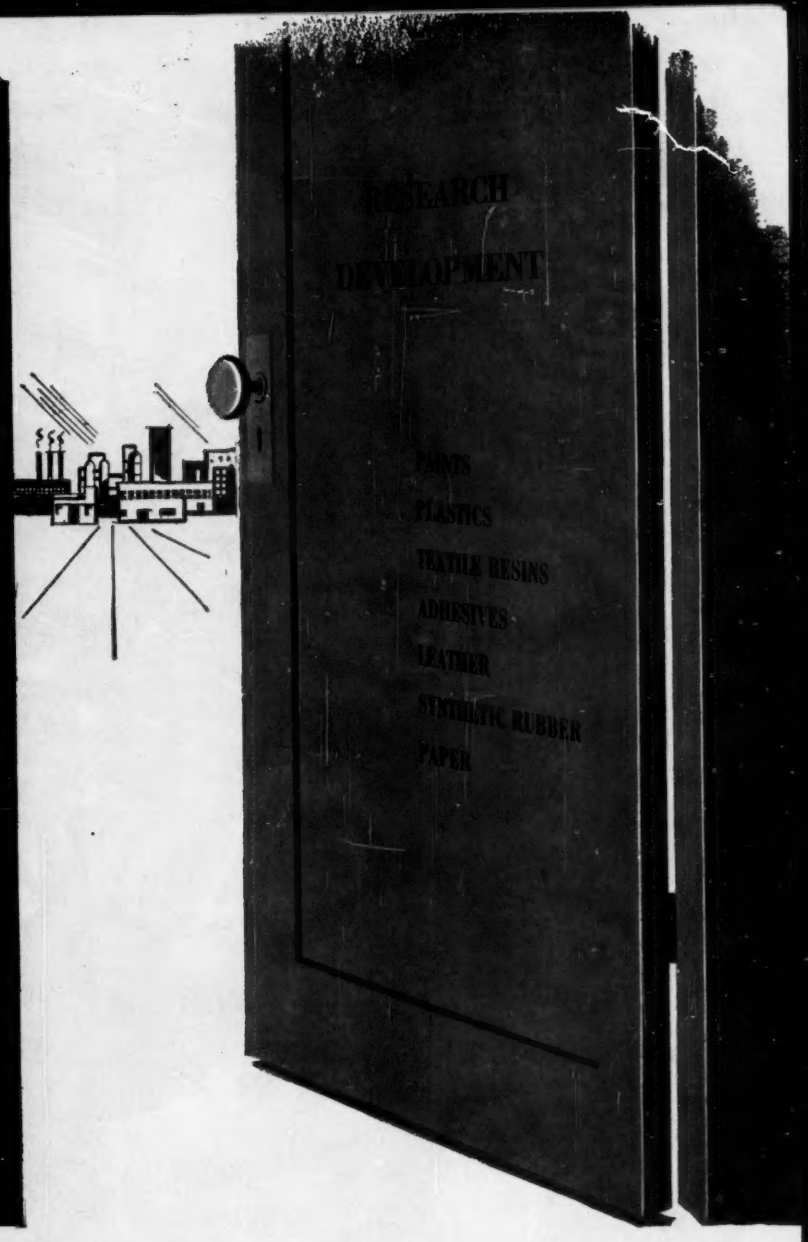
SELECTED PRICE CHANGES—Week Ending December 9, 1957

	Change	New Price
UP		
Molasses, blackstrap, feed grade, New Orleans, tanks, per gal.	$0.01	$0.12
Sulfur, crude, Mexican, bulk, imp., filtered, f.o.b. vessel, Coatzacoalcos, long ton	1.00	24.00
DOWN		
Lead metal, prime, pigs, New York	$0.005	$0.13
Litharge, coml., powd., bbls., c.l., wks., frt. equald.	0.005	0.1475
Mineral, orange, American, bbls., l.c.l., wks.	0.005	0.1860
Selenium, powder, 99½%, dms., dlvd.	3.00	7.50

All prices per pound unless quantity is stated.

CELANESE MONOMERS

open the door for product improvement



Celanese now offers you a choice of three vinyl monomers for the development of better emulsion paints, adhesives, coatings, finishes, laminates, plastics and synthetic rubbers.

Celanese Vinyl Acetate, a truly versatile chemical, is the starting point in the development of a variety of end products, such as adhesives, textile sizes, protective coatings, sheets, film and extrusion molding compounds.

Celanese Vinyl Propionate copolymers offer promising applications in the fields of adhesives, emulsion paints, plastics, synthetic rubbers, protective coatings and finishes, chewing gum resins.

Celanese Methyl Isopropenyl Ketone, a new vinyl monomer, forms tough plastics in homopolymerization, and copolymerizes with many commercially available vinyls for use in plastics, films, elastomers and adhesives.

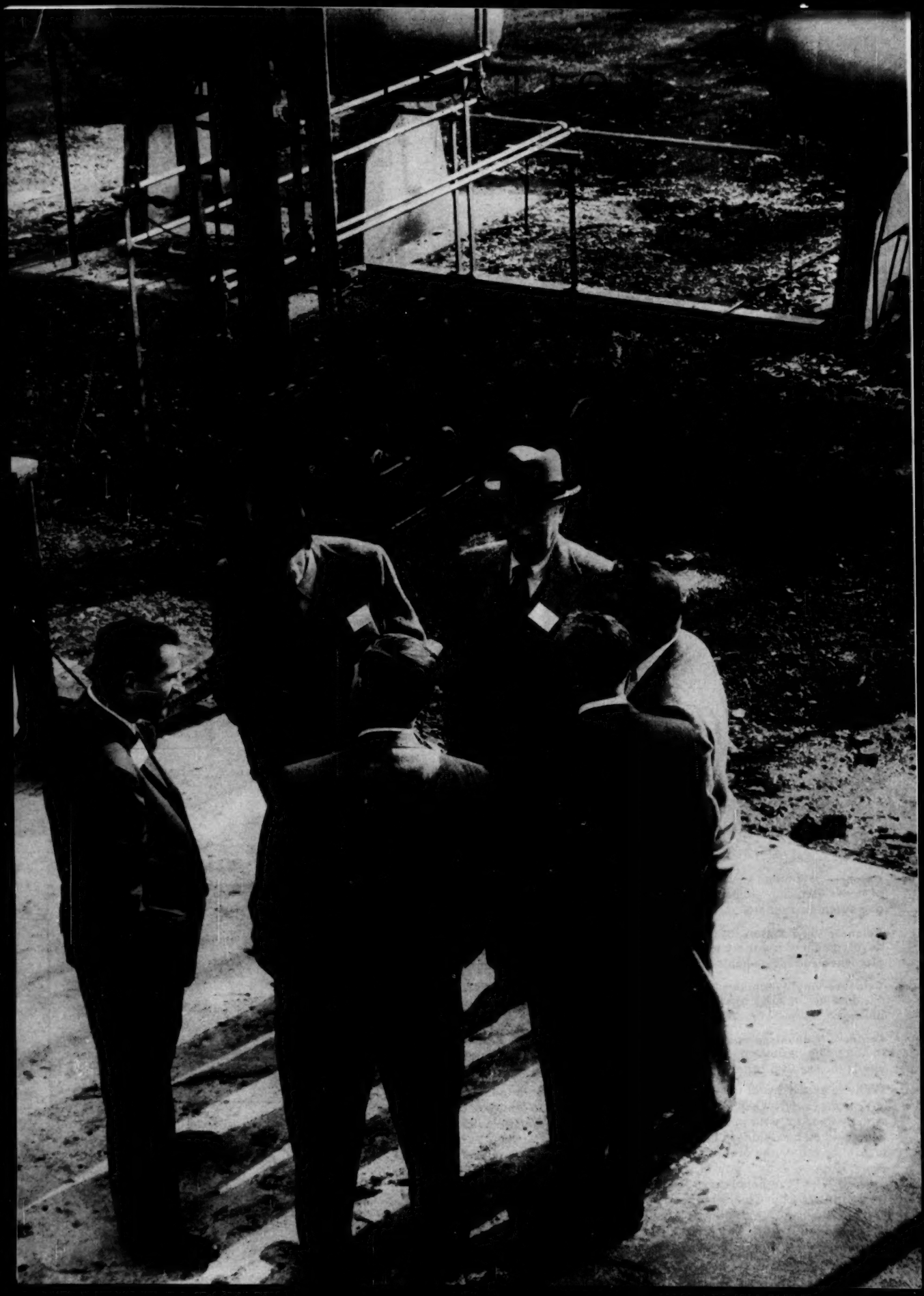
With the expansion of the Celanese development program to include **Acrylic Acid Esters,** Celanese will soon be in a position to offer you a broader range of monomers for your product development programs. Meanwhile, data accumulated by Celanese Research on Acrylic Acid Esters can be made available to you for use as the groundwork in your plans for the future. Also available from Celanese to help you in your planning are technical data sheets on Vinyl Acetate, Vinyl Propionate and Methyl Isopropenyl Ketone, specially prepared for your use by the Celanese Chemical Division.

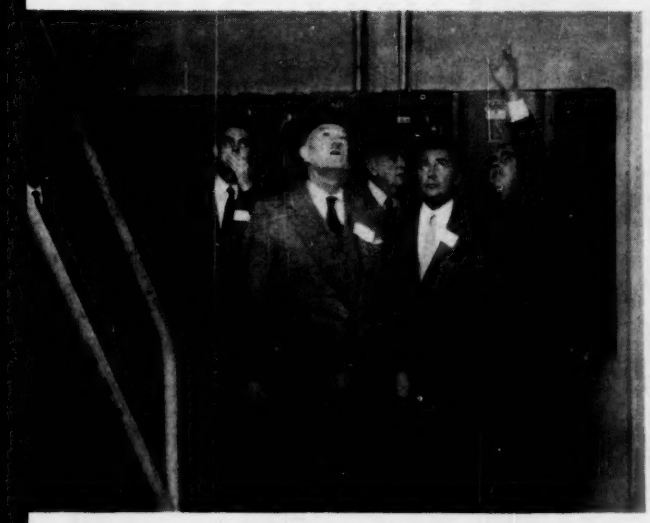
Write: Celanese Corporation of America, Chemical Division, Dept. 652-L.
180 Madison Avenue, New York 16, N. Y.

Celanese®

	VINYL ACETATE	VINYL PROPIONATE	METHYL ISOPROPENYL KETONE
	Descriptive Data	Descriptive Data	Descriptive Data
Distillation Range @ 760 mm, °C	71.8-73.0	within 1° (including 94.9)	98 (true boiling point of pure product)
Color APHA, max.	5	10	water-white
Water, % wt., max.	0.15	0.15	1.5
Specific Gravity @ 20°/20°C	0.9330-0.9340	0.9170-9180	0.8555-0.8565
Acidity as acetic acid, % wt., max.	0.02	0.1	—

Celanese CHEMICALS





Catalin board members, on annual plant tour, are briefed on new pilot plant (at right).

The Board Sees New Program's First Payoff

Directors of Catalin Corp. of America last fortnight got a plus with their annual "educational" tour of the company's Fords, N.J., plant. They got their first glimpse of $150,000 worth of new facilities that represent the first tangible results of a multistep, 10-year reorganization program that they put into action five years ago.

The new facilities—featuring the company's first "really adequate" pilot plant—show how they intend to place increased emphasis on basic research and development.

The board has already approved a total of $250,000 for construction of the pilot plant and adjacent facilities. Says Joseph Hyman, vice-president, technical director and guiding hand of the chemical division's reorganization, a total of $500,000 will be spent expanding research and development facilities at the plant within the next five years.

Annual Tours: The tour by the Catalin board was part of a continuing program to familiarize directors with operations at Catalin's three plants. Each year, directors tour the plant at

CW PHOTOS—LIONEL CRAWFORD

Extruder forms polystyrene into strands prior to pelletizing. Directors asked many questions, closely examined (right) physical testing steps used to check the quality of finished plastic.

High-level huddle, one of many, found board members and executives discussing tour highlights.

Tensile strength test, one quality control measure, interested many*.

WALKER GRIMM

Chemical lab is reminder of board's desire for more basic research.

Quiet retreat in library gives tourees* chance to compare notes.

one of three locations: Calumet City, Ill., Thomasville, N.C., or Fords. Catalin management feels that the tours are particularly beneficial, since six of the company's 10 directors do not have process industry experience. (They represent the professions of law, construction engineering, management engineering, securities and investments.)

Tour Guide: Commenting on Catalin's efforts to expand into new areas of the chemical industry, particularly in chemical specialties, President Harry Krehbiel said the new facilities shown to the directors represent completion of only the first step of the expansion program.

"Our familiarity with phenolic products, which dates from the company's beginning in 1929, has been used as a base on which to build the new division," Krehbiel said.

"And despite growth in new directions," he pointed out, "liquid resins will continue as Catalin's most important products." The company, which manufactures and sells raw materials for plastic products, as well as products used in lubricating oils, fuels, foods and rubber (including a line of antioxidants), had a net income last year of $390,627; net profits from sales, $691,529.

Krehbiel also explained that the new pilot-plant facilities at Fords "will enable us to put into pilot-plant operation processes developed under licensing agreements with foreign companies."

Future Move: Actually, Krehbiel said, increased emphasis on research and development is a preparatory step for a move scheduled for '60: taking over the polystyrene plant at Calumet City, now leased to and operated by Dow Chemical Co.

In explaining Catalin's plans for the Calumet City plant, Krehbiel expressed the spirit of adventure and expansion noticeable in many of the company's executives. "We don't plan to limit ourselves to polystyrene production at Calumet City. We already have several new products in mind."

* In the photos (*left to right*): (*top left, p. 95*) Stan Kordzinski, chief chemist; Ken Briggs, vice-president — production; Directors Alan Mann (chairman), Charles Stevenson, Krehbiel (president), William Miller, vice-president —engineering; (*bottom right, p. 95*) Leo Beck (*right*), director and executive vice-president; (*top, above*) Directors Fred Martin (secretary and treasurer), Richard Buell, Paul Murphy, Cornelius Reid; (*bottom, above*) Hyman (*center front*).

Where can you use the unique characteristics of persulfates?

All peroxygens carry active oxygen in their molecules, but the persulfates offer these special properties as well: Unusually high oxidation potential, good resistance to catalytic decomposition, and a reactive anion that gives reactions quite different from those of other peroxide compounds.

You'll find persulfates have particular values in processes involving emulsion polymerization of monomers and depolymerization of organic polymers. Persulfates excel in such applications as processing color films, etching printing plates, and modifying starches; and are of interest as reactive oxidizing agents for many other purposes.

Perhaps *your* processing techniques can be improved through the use of Becco Persulfates. A Becco field engineer will be glad to discuss this with you, at no obligation . . . drop us a line. At the same time, ask for your free copy of these booklets:

Nos. 34 and 68, "Uses of Persulfates"
No. 63, "Action of Persulfates on 1, 2-Glycols"
No. 86, "Improving Properties of Copper Surfaces"

BECCO CHEMICAL DIVISION
Food Machinery and Chemical Corporation
Station B, Buffalo 7, New York
BUFFALO • BOSTON • CHARLOTTE, N.C. • CHICAGO
NEW YORK • PHILADELPHIA • VANCOUVER, WASH.

Progress in Peroxygens ® BECCO

fmc FOOD MACHINERY AND CHEMICAL CORPORATION ®

FMC CHEMICALS INCLUDE: BECCO Peroxygen Chemicals • WESTVACO Phosphates, Barium and Magnesium Chemicals • WESTVACO Alkalis, Chlorinated Chemicals and Carbon Bisulfide • NIAGARA Insecticides, Fungicides and Industrial Sulphur • OHIO-APEX Plasticizers and Chemicals • FAIRFIELD Pesticide Compounds and Organic Chemicals

Greeff

SERVING THE CHEMICAL INDUSTRY SINCE 1880

PHOSGENE
•
URETHANE
•
DIETHYL CARBONATE

R. W. GREEFF & CO., INC.
10 ROCKEFELLER PLAZA, NEW YORK, N. Y.
TRIBUNE TOWER, CHICAGO, ILLINOIS

"NOSEY" says:

YOU can get from FRITZSCHE — **without charge** — the top-notch services for which some "experts" are asking substantial consulting fees. In fact, FRITZSCHE'S 86-year-old business has been built almost entirely upon **service** — the kind that digs down into your odor problem and conducts experiment after experiment until it has produced the tailor-made solution which exactly fits **your** precise and individual needs. You invest nothing. Furthermore. FRITZSCHE has to be competitive both as to product and price. So, why not avail yourself of FRITZSCHE'S Industrial Odorant Service! Get hep, man! . . . it's FREE!

FRITZSCHE Brothers, Inc.
Established 1871
PORT AUTHORITY BUILDING
76 NINTH AVENUE, NEW YORK 11, N.Y.

IF YOU NEED...

WAXES
Carnauba Replacements, Japan Wax Replacements, Microcrystalline, Self-Emulsifiable and Water Soluble Waxes. Also, Special Waxes To Meet Your Requirements.

CRESYLIC ACID
in any amount at any time

"Write or call . . . that's all"

CONCORD CHEMICAL COMPANY
INCORPORATED
Camden 1, New Jersey
Phone Woodlawn 6-1526 Cable Conchem

ADMINISTRATION

UNITED PRESS

Judge Ganey: With a jury's help, no liability for penicillin.

LEGAL

Penicillin Not to Blame: Upjohn Co. has been found not guilty of producing and selling adulterated penicillin, as charged by a doctor and 37 of his patients. Upjohn was cleared by the jury in a trial before Judge J. C. Ganey in U.S. district court at Philadelphia.

The plaintiffs charged that the penicillin made by Upjohn and administered by Dr. Elkin Ravetz had caused eruptions and abscesses on 37 of his patients early in 1952. Upjohn countered with evidence that the 100 vials of penicillin that Ravetz had were part of a 13,000-vial batch delivered nationally, and that no other complaints had been received.

•

Tax Appeal: Georgia's Attorney General has decided to appeal the recent Georgia supreme court tax decision that firms maintaining sales representatives in the state (but not inventories), need not pay state income tax. The court had ruled that such firms are not liable for the tax on the grounds that such liability violates the interstate commerce provisions of the federal constitution.

The case, in which Stockham Valves Co. successfully recovered income taxes paid to the state, will be appealed to the U.S. Supreme Court, where a decision against the state could have widespread impact on chemical firms with Georgia sales offices.

LABOR

Negro Hiring: Government suppliers are hiring more Negroes for production work and for skilled trades, but they're slower in putting them into white-collar positions, according to a new survey made by the government's antidiscrimination committee. The survey included chemical plants in its 508-plant analysis of firms doing business with the government. The survey is the first of a series the committee intends to make.

•

Climax Strike: Climax Molybdenum Co. and Local 1311 of United Auto Workers (AFL-CIO) have settled a five-month strike at the company's molybdic oxide and ferromolybdenum plant near Langeloth, Pa. Terms of the three-year contract call for a 13¢ an hour wage hike across the board, with a 7¢/hour increase in Nov. '58, and a wage reopener in Nov. '59. The company has also instituted a supplementary unemployment benefits (SUB) plan patterned after that in the steel industry and incorporating a standard escalator clause based on Bureau of Labor Statistics figures. The SUB plan goes into effect in April '58.

KEY CHANGES

Duane E. Roland, to director, Synthane Corp. (Oaks, Pa.).

Lockwood W. Ferris, to president, and **William L. Brady,** to board chairman, Bonneville Ltd. (Wendover, Utah).

Doran S. Weinstein, to president, Devoe & Raynolds, Inc. (New York).

Kerby H. Fisk, to board chairman, and **Carlton Bates** and **Harry S. Ferguson,** to executive vice-presidents, Allied Chemical & Dye Corp. (New York).

John V. Collis, to board chairman; **Jefferson D. Stewart, Jr.,** to president, Federal Chemical Co. (Louisville).

Russell F. Erickson, to executive vice-president, Rayonier Inc., (New York).

KUDOS

To **August Kochs,** chairman, Victor Chemical Works, a commendation award for service to the industry, by the Manufacturing Chemists' Assn.

Just Published!

The NEW Dicalite Technical Bulletin B-13 is just off the press. Completely revised, this new general handbook on filtration with filteraids has been expanded to 24 pages, illustrated with charts, diagrams and photographs. In addition to its clear discussion of the principles of filtration, Dicalite Bulletin B-13 contains information on the factors involved in filter station layout and design, and a great deal of practical operating data on both pressure and vacuum systems. We will be glad to send you a copy with our compliments.

Dependable GLC GREAT LAKES Dicalite® DIATOMACEOUS MATERIALS

Dicalite Dept., Great Lakes Carbon Corporation
612 So. Flower St., Los Angeles 17, Calif.

Please send me my free copy of Technical Bulletin B-13

Name_____ _____
Title or Position

Company_____

Address_____

City_____ Zone_____ State_____

CW Report 483 New Chemicals for Industry

Here are 483 New Chemicals for Industry—CW's annual roundup. The chemicals and specialty products listed here represent manufacturers' reports of the new materials that they have introduced during 1957. To obtain addresses of manufacturers unfamiliar to you, check the Chemical Week Buyers' Guide Issue (Sept. 21).

ACCOBOND® 3809, 3810, 3913 Bonding Agents

Characteristics: Accobond 3809: 37% solids; Accobond 3810: dry powder; Accobond 3913: 80% solids. Solubility: All of these Accobond bonding agents are water-soluble. Chemical properties: Accobond 3809: cationic; Accobond 3810: anionic; Accobond 3913: non-ionic. Suggested uses: these bonding agents are used as a treatment for solid surfaces and continuous films to improve the adhesion of subsequently applied surface coatings, laminates, adhesives, etc. Availability: commercial quantities. American Cyanamid Co., New Product Development Dept.

ATOMIZED A-C POLYETHYLENE (polyethylene)

M.W. 2,000; Sp. G. .92; M.P. 102C. Characteristics: white powder, odorless. Properties: fine particle size permits easy dispersion. Suggested uses: in printing inks, rubber and vinyl additives, paints and lacquers. Availability: commercial quantities. Allied Chemical & Dye Corp., Semet-Solvay Petrochemical Division.

A-C POLYETHYLENE 629 (polyethylene)

M.W. 2,000; Sp. G. .92; M.P. 102C. Characteristics: white pellets. Properties: emulsifiable polyethylene. Suggested uses: in floor polishes, textile size and finish, paper size, paints. Availability: commercial quantities. Allied Chemical & Dye Corp., Semet-Solvay Petrochemical Division.

ACRYLIC ACID (30% aqueous solution)

CH_2:CHCOOH; M. W., 72.07; Chemical properties: Can be homopolymerized or copolymerized with most active monomers such as acrylonitrile, styrene, acrylic esters and vinyl esters; will add compounds with active hydrogens, thus providing a means of introducing the carboxylic acid group. Suggested uses: preparation of homopolymers and copolymers for use as textile sizes and finishes, metal finishes, latex paints, aqueous thickeners, and resin emulsions for floor polishes. Availibility: Commercial quantities. Union Carbide Chemicals Co. division of Union Carbide Corp.

ACRYSOL® P-6

A liquid emulsion for sizing filament Dacron, applied on conventional equipment with no additives required after neutralization. It has advantages of no scumming during application, with negligible shedding, flaking, or pick-off on the loom. Excellent weaving efficiency has been noted. Availability: commercial quantities. Rohm & Haas Co.

ADACANE A-12 (dodecane)

$C_{12}H_{26}$. Constituents: 90% C-12, 1% C-10, 9% C-14. M. W. 172-174; —13C cloud point; Purity: 90%. Characteristics: oily water-white liquid. Solubility: Excellent solubility characteristics in most common organic solvents. Chemical properties: chemically unreactive and markedly stable under radiation. Suggested uses: radiation lubricants and other specialized lubricant applications. Availability: Limited commercial quantities. Archer-Daniels-Midland Co., Chemical Products Division.

ADACANE A-51

C_nH_{2n+2}. Constituents: mixed C-14 to C-20 chain length, straight chain hydrocarbons. 6% C-12, 14% C-14, 42% C-16, 33% C-18, 5% C-20. M. W. 232 (av); 22C cloud point; Characteristics: white waxy semisolid at room temperature. Solubility: excellent solubility characteristics in most common organic solvents. Chemical properties: chemically unrecreative and markedly stable under radiation. Suggested uses: radiation lubricants and other specialized lubricant applications. Availibility: Limited commercial quantities. Archer-Daniels-Midland Co., Chemical Products Division.

ADACANE A-54 (hexadecane)

$C_{16}H_{34}$. Constituents: 62% C-16, 2% C-14, 34% C-18, 2% C-20. M.W. 234-242; 11 C cloud point; Purity: 62%. Characteristics: oily water-white liquid. Solubility: excellent solubility characteristics in most organic solvents. Chemical properties: chemically unreactive and markedly stable under radiation. Suggested uses: radiation lubricants and other specialized lubricant applications. Availability: limited commercial quantities. Archer-Daniels-Midland Co.

ADACANE A-71

C_nH_{2n+2}. Constituents: 11% C-18, 51% C-20, 38% C-22; M.W. 282-310; M.P. 3 C; Characteristics: white waxy solid. Solubility: excellent solubility characteristics in most common organic solvents. Chemical properties: chemically unreactive and markedly stable under radiation. Suggested uses: radiation lubricants and other specialized lubricant applications. Availability: limited commercial quantities. Archer-Daniels-Midland Co., Chemical Products Division.

ADECENE A-12 (dodecene-1)

$C_{12}H_{24}$ (90%). Constituents: 90% C-12 α-olefin, 1% C-10, 9% C-14. M. W., 169-172; —4 C cloud point. Purity: 90%. Characteristics: oily water-white liquid. Solubility: excellent solubility characteristics in most common organic solvents. Chemical properties: undergoes addition, poly-

*Registered trademark.

merization and other reactions typical of the double bond. Suggested uses: chemical intermediates, lubricating oil additives, viscosity index improvers, pour point depressants, detergents, rust inhibitors and lead scavengers; also, leather treating, textile and paper chemicals, adhesives, plastics, synthetic rubber, polymers, resins, surface active agents, and protective coatings. Availability: limited commercial quantities. Archer-Daniels-Midland Co., Chemical Products Division.

ADACENE A-13 (tetradecene-1)

$C_{14}H_{28}$. Constituents: 90% C-14 α-olefin, 4% C-12, 4% C-16, 2% C-18. M.W. 196-207; Purity: 90%. Characteristics: oily water-white liquid. Solubility: excellent solubility characteristics in most common organic solvents. Chemical properties: undergoes addition, polymerization and other reactions typical of the double bond. Suggested uses: chemical intermediates, lubricating oil additives, viscosity index improvers, pour point depressants, detergents, rust inhibitors and lead scavengers; also, leather treating, textile and paper chemicals, adhesives, plastics, synthetic rubber, polymers, resins, surface active agents, and protective coatings. Availability: limited commercial quantities. Archer-Daniels-Midland Co., Chemical Products Division.

ADIPOL® DIBA (di-isobutyadipate)

$(C_2H_4COOCH_2CHCH_3CH_3)_2$. M.W. 258; Sp. G. 0.953±0.003; B. P., 143-150 C (at 4 mm.). Characteristics: liquid, slight characteristic odor. Solubility: insoluble or limited solubility in glycerine, glycols, and some amines; soluble in most other organic liquids. Suggested uses: F.D.A. approved for food packaging; polyvinyl chloride plastic compounds can be cured to optimum physical properties at much lower than normal temperatures. Availability: commercial quantities: Food Machinery and Chemical Corp., Organic Chemicals Division.

AGENTS AT-339 to 344 (n-alkyl-γ-hydroxybutyramides)

$RNHCO(CH_2)_3OH$; M.P. 50-70C. Characteristics: tan wax-like solids. Solubility: aromatic and aliphatic hydrocarbons, esters, alcohols, ethers plasticizers. Chemical properties: form thixotropic gels in many organic liquids; form stable water-in-oil emulsions containing up to 95 parts water; corrosion inhibitors. Suggested uses: emulsifiers for water in oil systems; thickening and gelling agents; corrosion inhibitors; oil-soluble surfactants; antistatic agents; textile softening and lubricating agents. Availability: experimental quantities. General Aniline & Film Corp., Commercial Development Dept.

ALATHON® 5F (polyethylene resin.)

Black, opaque solid in the form of cubes, about ⅛ inch on a side. Physical properties: Intermediate in density, with good yield strength in hot summer weather without sacrificing impact-resistance at lower temperatures. Contains finely divided carbon black dispersed to give maximum protection from sunlight. Melt index in range most commonly used for film and paper-coating resins. Suggested uses: in heavy film (2 mils and up) and heavy paper coatings requiring resistance to outdoor weathering; conveying and storage of irrigation water; protection of harvested crops from weather; agricultural and horticultural mulch; water-resistant construction papers. Availability: commercial quantities. E. I. du Pont de Nemours & Co., Plastics Sales Division, Polychemicals Dept.

ALATHON® 31 (polyethylene resin.)

White translucent solid in the form of cubes ⅛ inch on a side. Physical properties: very viscous in the molten state, with little tendency to sag during heating prior to thermoforming. Exceptionally resistant to environmental stress cracking. Suggested uses: extrusion of heavy sheet for use in thermoforming operations; especially suited to the production of thin wall containers, trays, covers, housings, liners, lids, shoe compartments, hats, and other items formed from sheet material. Availability: commercial quantities. E. I. du Pont de Nemours & Co., Plastics Sales Division, Polychemicals Dept.

ALIPAL GB-520 & MC-470 (modified alkyl phosphate ester)

Purity: 99+%. Characteristics: viscous liquid. Chemical properties: anionic; unusual solubility and emulsifying properties in comparison with other anionics, such as alkyl phosphates or alkyl aryl sulfonates. Suggested uses: as a lubricant, antistatic agent, and softener for textiles; mineral oil emulsifier; in latex polymerization for difficult-to-emulsify monomers. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

ALKYLANILINE C-12 (ar-(Dodecyl)aniline)

$C_{12}H_{25}C_6H_4NH_2$; M.W. 260; Sp. G. 0.906 at 25/4 C; Purity: technical; B.P. 295-345 C; Characteristics: liquid, light red-brown to brown on aging. Solubility: soluble in monochlorobenzene, acetone, benzene, ether; insoluble in water. Chemical properties: weakly basic; undergoes reactions typical of aromatic amines; reacts readily with aldehydes to form Schiff bases from which secondary amines and nitrile derivatives may be obtained; precursor for isocyanate and urea derivatives. Suggested uses: intermediate for use in petroleum, agricultural and pharmaceutical applications. Availability: commercial quantities. Monsanto Chemical Co., Organic Division.

ALLANTOIN

$C_4H_6N_4O_3$; M.W. 158; M.P. 228 C min. Characteristics: white odorless crystals. Solubility: slight in cold water (1:200); 1:500 in alcohol; more soluble in hot water and hot alcohol. Suggested uses: medical and pharmaceutical intermediate; component of formulations in wound and ulcer healing. Availability: semicommercial quantities. Fine Organics Inc.

ALLYL CARBAMATE

$SH_2CHCH_2OCONH_2$; M.W. 101; Sp. G., 1.0895 (20/20); M.P. 19.5 C; Purity: 99.5%; B.P. 144 C (100mm.); 112C (25mm.). Characteristics: crystals; 30 APHA. Solubility: 25.0% by wt. in water at 25 C; insoluble in hexane; soluble in benzene, ethanol and carbon tetrachloride. Suggested uses: as a chemical intermediate; solvent properties. Availability: laboratory quantities. Food Machinery and Chemical Corp., Organic Chemical Division.

ALLYL CHLOROFORMATE

CH_2CHCH_2OCOCl; M.W., 120.5; Sp. G., 1.1370 (20/20); Purity, 99.5%; B.P. 112-114 C (90%). Characteristics: water-white liquid. Solubility: soluble in hexane, benzene, ethanol and carbon tetrachloride. Suggested uses: as a reactive intermediate, particularly in reactions with active hydrogen compounds. Availability: laboratory quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

ALLYL 9, 10-EPOXYSTEARATE

$C_{12}H_{38}O_3$; M.W., 338.54; Sp. G., 0.9217 at 20/20C; B.P. 282C (50 mm.), 237C (10 mm.). Solubility: in water, less than 0.01% by wt. at 20C; solubility of water in, 0.3% by weight at 20C. Chemical properties: reacts at the epoxy group with compounds containing labile hydrogen atoms; undergoes typical addition reactions at the double bond. Suggested uses: as a chemical intermediate; can be polymerized through the epoxy group or double bond. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

ALLYL TOSYLATE

M.W., 212; Purity: over 90%. Characteristics: mobile, yellow-orange liquid, slight odor characteristic of allylic group. Solubility: insoluble in water, soluble in most common organic solvents. Chemical properties: this highly reactive alkylating agent takes part readily in most substitution reactions to introduce the allyl group. Suggested uses: as an intermediate for the introduction of the allyl group under mild conditions. Availability: semicommercial quantities. Fine Organics, Inc.

AMBIDEX and AMBIDEX-O

(Complex amine salt) Characteristics: Ambidex is a dark liquid; Ambidex-O is an amber colored liquid. Solubility: oil soluble. Outstanding features: excellent emulsifier and wetting agent with pronounced detergency. Availability: commercial quantities. Carlisle Chemical Works, Inc.

AMINE ODT (N-[dodecenyl]diethylenetriamine)

$C_{12}H_{23}NHC_2H_4NHC_2H_4NH_2$; M.W. 269; Sp. G., 0.896 at 25/25 C; Purity: technical; B.P. 60% between 140-200 C at 2 mm. Characteristics: light brown liquid; characteristics amine odor. Solubility: soluble in alcohol, acetone, toluene, xylene, carbon tetrachloride, kerosene, mineral and lubricating oils; insoluble in water, but partially dispersible, since it will absorb four times its weight of water. Chemical properties: reactions characteristic of aliphatic amines; forms salts, amides and quaternaries. Suggested uses: intermediate for preparation of materials useful as bacteriostats, corrosion inhibitors, lubricant additives, and surface-active agents. Availability: semicommercial quantities. Monsanto Chemical Co., Organic Division.

o-AMINO BENZANILIDE

$C_{13}H_{12}ON_2$; M.W. 212; M.P. 128-131 C; Purity: 95%+. Characteristics: white crystals. Solubility: soluble in benzene, dioxane, dimethyl formanide and strong acids; slightly soluble in methanol and ether. Suggested uses: as a chemical intermediate. Availability: experimental quantities. Maumee Chemical Co.

2-AMINOETHYLISOTHIOURONIUM B. HB

$C_3H_{11}N_3SBr_2$; M. W. 281.0; M. P. 188-189C. Characteristics: white, crystalline solid; normal pH—3.5. Solubility: very soluble in water, sparingly soluble in isopropyl alcohol. Chemical properties: stable when dry and pure; forms 2 mercapto ethyl-guanidine at physiological pH with liberation of free sulfhydryl; water degrades AET to form 2-amino-thiazoline. HBr, which lowers the M.P. considerably. Suggested uses: most effective in experimental protection of animals against radiation damage; also of biochemical interest in enzyme activation; serves as a free radical detoxifier and is of interest in clinical investigations. Availability: commercial quantities. Schwarz Laboratories, Inc.

p-AMINOPHENYLMERCAPTOACETIC ACID

$NH_2Ph\text{-}S\text{-}CH_2CO_2H$; M.W. 183.23; M.P. 186-187 C; Purity: 98%. Characteristics: off white crystals. Solubility: insoluble in most common solvents; soluble in alkali or acid. Suggested uses: as a pharmaceutical and dye intermediate. Availability: semicommercial quantities. Evans Chemetics, Inc., Chemical Division.

o-AMINO PHENYL THIOBENZOATE

$C_{13}H_{11}ONS$; M.W. 229; M.P. 106-107 C; Purity: 98%. Characteristics: light yellow crystals with slight mercaptan odor. Solubility: slightly soluble in methanol, ether, and benzene. Suggested uses: as a chemical intermediate. Availability: experimental quantities. Maumee Chemical Co.

AMMONIUM O,O-DIETHYL PHOSPHORODITHIOATE

$(C_2H_5O)_2P(S)SNH_4$; M. W., 203; M. P. 165-166 C (decomp.); Purity: 97% min. Characteristics: white to tan crystalline solid. Solubility: soluble in water, alcohol and acetone; insoluble in benzene, heptane, chloroform. Chemical properties: readily yields the dialkyl phosphorodithioic acid which can be chlorinated, alkylated or added to active reagents. Suggested uses: as an intermediate for preparation of insecticides and agricultural chemicals. Availability: experimental quantities. Monsanto Chemical Co., Organic Division.

n-AMYL CHLOROFORMATE

$C_5H_{11}OCOCl$; M.W. 150.5; Sp. G., 1.0253 (20/20); Purity, 95.11%; B.P. 68 C (25 mm.); 82 C (50 mm.). Characteristics: water-white liquid. Solubility: soluble in hexane, benzene, ethanol and carbon tetrachloride. Suggested uses: reactive intermediate, particularly in reactions with active hydrogen compounds. Availability: experimental quantities. Food Machinery and Chemical Corporation, Organic Chemicals Division.

AN-1 ANTIOXIDANT FOR PETROLEUM FUELS (2,6-di-tert-butylphenol)

$(C_4H_9)_2C_6H_3OH$; M.W., 206.3; Sp. G., 0.914; M.P., 37 C; Purity, 98 + %; B.P. 253 C at 760 mm. Characteristics: light straw, crystalline solid. Solubility: weight % at 20 C: in toluene or benzene 78%, in ethyl alcohol 48%; insoluble in water or 10% sodium hydroxide. Chemical properties: a phenolic antioxidant. Suggested uses: in motor and aviation gasolines to inhibit the formation of gum and the decomposition of TEL during storage; in jet fuels, to inhibit the formation of soluble and insoluble decomposition products during storage. Availability: commercial quantities. Ethyl Corp., Business Research Division.

AN-2 ANTIOXIDANT FOR LUBRICATING OILS (4,4'-methylenebis[2,6-di-tert-butylphenol])

$C_{29}H_{44}O_2$; M.W., 424.6; Sp. G., 0.990 at 20 C; M.P., 154 C; Purity 98 + %; B.P. 289 C at 40 mm. Characteristics: light straw, crystalline solid. Solubility: weight % at 25 C: in toluene 33%, in ethyl alcohol 6%; insoluble in water or 1.0 N sodium hydroxide; soluble in petroleum oils, 1.0-1.5 weight % at —18 C. Chemical properties: a low volatility, nonsludging, temperature-stable phenolic antioxidant and antiwear agent. Suggested uses: in motor oils for both gasoline and diesel engines, to inhibit oxidation and bearing corrosion, and to minimize scuffing-type piston ring wear when used alone or in combination with sulfonate or phenate detergents; in automatic transmission fluids and industrial oils, to inhibit oxidation at high temperatures. Availability: commercial quantities: Ethyl Corp., Business Research Division.

AN-3 ANTIOXIDANT FOR INDUSTRIAL LUBRICANTS (2,6-di-tert-butyl-α-dimethylamino-p-cresol)

$C_{17}H_{29}ON$; M.W., 263.4; Sp. G., 0.970 at 20 C; M.P., 94 C; Purity, 98+%; B.P., 179 C at 40 mm. Characteristics: light straw-colored, crystalline solid. Solubility: weight % at 25°C:

NEW CHEMICALS FOR INDUSTRY

in toluene 23%, in ethyl alcohol 31%; insoluble in water or 1.0 N sodium hydroxide; soluble in petroleum oils, 1.0-1.5 weight % at −18 C. Chemical properties: a polar compound combining the desirable properties of an effective temperature-stable phenolic antioxidant and a surface-active amine. Suggested uses: in motor oils, greases, steam turbine oils, and other industrial lubricants, to inhibit oxidation and to impart alkalinity, dispersancy, anti-rust and anti-wear properties. Availability: commercial quantities. Ethyl Corp., Business Research Division.

AN-25 THERMAL STABILIZER FOR JET FUELS (4,4'-bis[2-methyl-6-tert-butylphenol])

$C_{22}H_{30}O_2$; M. W., 326.5; Sp. G., 1.06 at 20 C; M. P., 185 C; Purity 98+%. Characteristics: light straw-color, crystalline solid. Solubility: weight % at 20 C: in methyl ethyl ketone 60%, in normal hexane 5%; insoluble in water. Chemical properties: a high temperature phenolic antioxidant. Suggested uses: in jet fuels, to reduce filter plugging and heat exchanger tube fouling. Availability: experimental quantities. Ethyl Corp., Business Research Division.

AN-33 ANTIOXIDANT FOR PETROLEUM FUELS (mixed tert-butylphenol)

Constituents: 2,6-di-tert-butylphenol (75% min.), 2,4,6-tri-tert-butylphenol (10-15%), ortho-tert-butylphenol (10-15%); Sp. G., 0.941 at 20 C). Freezing Pt., 18 C (supercools to 7-10 C). Characteristics: dark orange liquid. Chemical properties: a phenolic antioxidant. Suggested uses: in motor and aviation gasolines, to inhibit the formation of gum and the decomposition of TEL during storage; in set fuels, to inhibit the formation of soluble and insoluble decomposition products during storage. Availability: commercial quantities. Ethyl Corp., Business Research Division.

o-ANISALDEHYDE (o-methoxy benzaldehyde)

CHO $C_6H_4OCH_3$; M. W., 136.14; M. P., 35 C; Purity, 95%; B. P., 243 C. Characteristics: light tan solid. Solubility: insoluble in water; soluble in alcohol; very soluble in ether. Suggested uses: as a pharmaceutical intermediate. Availability: semicommercial quantities. Ansul Chemical Co.

ARBAN® 70 (triphenyl phosphate derivative)

Suggested uses: as a fire retardant for use with oil-type wood preservatives. Availability: commercial quantities. Dow Chemical Co.

ARCCO C-559

Constituents: a solution adhesive. Chemical properties: developed primarily as a flocking adhesive, particularly for the flocking of cotton and rayon fibers to vinyl, paper and cloth surfaces; also useful for the lamination of aluminum foil to leather. Suggested uses: cloth vinyl surfaces, and butyl rubber; moderately fast drying, has high initial strength, and forms a tough, flexible bond. Availability: commercial quantities. The Borden Co., Chemical Division, Coatings and Adhesives Dept.

ARCCO C-652

Constituents: solvent solution of a compounded high molecular weight vinyl resin. Chemical properties: can be applied to the surface to be coated by either knife, reverse roll coater, gravure, or spray; air drying, but may be dried at elevated temperature for faster operation. Suggested uses: as a top coat for abrasion, blocking, and plasticizer migration resistance; excellent for calendered vinyl film or sheet and fabrics coated with vinyl plastisol or organosol. Availability: commercial quantities. The Borden Co., Chemical Division, Coatings and Adhesives Dept.

ARCCO RP15-135C RP15-93C, A and B RP15-135D

Chemical properties: these bond coatings, applied either by a one-coat or a two-coat system, obtain high strength, flexible bonds of plastisol and organosol film to nylon and other synthetic fabrics; they can be applied by padding, roll coater, gravure coater, or spray processes; adhesion values exceed 20 lbs. peel strength per 2-in. width. Availability: commercial quantities. The Borden Co., Chemical Division, Coatings and Adhesives Dept.

ASTON LT and 108

Characteristics: somewhat viscous straw to amber colored solutions. Chemical properties: these products impart high orders of antistatic protection to all synthetic fabrics, requiring a catalyst to achieve maximum effects. Availability: commercial quantities. Onyx Oil & Chemical Co., Textile Division..

ASTON R

Chemical properties: a cationic compound, 50% active, which imparts a nondurable antistatic effect to synthetic fabrics, yarns or fibers. Very small amounts are required for full antistatic protection. Availability: commercial quantities. Onyx Oil & Chemical Co., Textile Division.

8-AZAHYPOXANTHINE

$C_4H_3ON_5$; M. W., 137; M. P., 308 C; Purity, 98-100%. Characteristics: white, odorless powder. Solubility: 4.5 g./100 g. H_2O at 100 C. Chemical properties: an interesting purine analog. Suggested uses: for biochemical studies. Availability: experimental quantities. Krishell Laboratories, Inc.

BORAX-GLYCOL LANDENSATION PRODUCTS XPO-524

Constituents: anhydrous borax 25%; ethylene glycol 75%. Sp. G. 1.30. Characteristics: pale yellow color, odorless. Solubility: soluble in ethylene glycol, diethylene glycol, and carbitol. Chemical properties: very low water of crystallization, permitting development of higher boiling point fluids. Suggested uses: in high boiling point brake fluids. Availability: semicommercial quantities. U. S. Borax & Chem. Co., Pacific Coast Borax Co. Division.

BENZOGUANAMINE (2,4-diamino-6-phenyltriazine-1,3,5)

$C_3N_3(NH_2)2'C_6H_5$; M.W., 187.2; Sp. G., 1.4; M. P., 227 C (pure); Purity, 99% minimum. Characteristics: free flowing white crystalline solid, mild organic odor. Solubility: in water, nil; in methyl alcohol, 1.4%; in ether 0.2%; in dimethyl formamide, 12.0%; in methyl cellosolve, 13.7% (all wt % @ 25 C). Chemical properties: solid, reactive, aromatic diamine that is relatively nontoxic; phenyl group substituted for one of the melamine amino groups. Suggested uses: reacted with alcohols and aldhehydes to form wide variety of useful resins; analogous to melamine; of particular interest in alkyd industrial finishes; as an epoxy curing agent. Availability: commercial quantities. Tennessee Products & Chemical Corp.

BENZONITRILE (benzene carbo nitrile)

C_6H_5CN; M. W., 103.12; Sp. G., 1.008; M. P., −12.75 C (pure); Purity, 98% minimum; B. P., 190.7 C (pure). Characteristics: colorless liquid with almond-like odor resembling benzaldehyde. Solubility: in water (100 C), 1%; alcohol and ether, completely miscible. Chemical properties: stable, high-boiling, aromatic nitrile. Suggested uses: in the production of triazine resins (benzoguanamine); as a solvent (gum arabic, chlorinated rubber, cellulose acetate, acrylic fibers); as an extractive distillation agent (separation of isomers of xylene, etc.). Availability: commercial quantities. Tennessee Products & Chemical Corp.

BENZYL TRIMETHYL AMMONIUM HYDROXIDE

$C_6H_5CH_2(CH_3)_3NOH$. Constituents: 40% solution of active base in water; M. W., 167; Sp. G., 1.10. Characteristics: pale straw colored, slightly viscous liquid. Solubility: soluble in lower aliphatic alcohols. Suggested uses: as a strong organic base to promote cyanoethylations, Michael additions, etc.; as a catalyst. Availability: experimental quantities. Eastern Chemical Corp., Development Dept.

BIOPAL VRO-20

Constituents: iodine-nonylphenoxy polyoxyethylene ethanol complex. Sp. G. 1.34 at 25C. Characteristics: a dark brown, pourable liquid. Solubility: soluble in water. Chemical properties: surface-active properties of a nonionic surfactant combined (at pH 4 or lower) with the germicidal properties of elemental iodine; markedly diminished toxicity by comparison with elemental iodine solubilized by conventional means. Suggested uses: for sanitizing or germicidal rinses; detergent-sanitizers; sterilizing agents; sanitizing or germicidal cleaners. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

BLANCOPHOR LS-81

Characteristics: fine, greenish-yellow, odorless powder. Solubility: soluble in water. Chemical properties: optical whitener which exhausts rapidly onto cellulosic materials, particularly paper producing a high white of blue-violet hue. Suggested uses: as an optical whitener for paper; designed for beater application. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

BORESTER 29 (2, 6-di-tert-butylphenyl di-n-butyl borate)

M. W. 362.37; Sp. G. 0.926 at 25 C; B. P. (in C) 150-154 C. Characteristics: pale yellow liquid; odor similar to 2, 6—di-tert-butylphenol. Solubility: Soluble in all proportions in acetone, benezene, chloroform and petroleum ether (20-40 C). Chemical properties: extremely resistant to hydrolysis; antioxidant. Suggested uses: as an antioxidant for lube oil. Availability: semicommercial quantities. U. S. Borax and Chemical Corp., Pacific Coast Borax Co. Division.

BORESTER 30 (2, 6-di-tert-butyl-4 methylphenyl di-n-butyl borate)

M. W. 376.40; Sp. G. 0.927 at 25 C; B. P. 167-171 C (1 mm.). Characteristics: colorless, similar to 2, 6,-di-tert-butyl-4-methylphenol. Solubility: in all proportions in acetone, benzene chloroform and petroleum ether (20-40°). Chemical properties and/or outstanding features: Extremely resistant to hydrolysis; antioxidizing properties. Suggested uses: as an antioxidant in lube oil. Availability: semicommercial quantities. U. S. Borax and Chem. Corp., Pacific Coast Borax Co. Division.

BUTADIENE MONOXIDE (3,4-epoxybutene-1)

C_4H_6O; M. W., 70.1; Sp. G., 0.8693; M. P., below −85 C; B. P., 66 C. Characteristics: sharp, gasoline like odor. Solubility: miscible with alcohol, acetone, ether, ethyl acetate, chloroform, benzene, and petroleum ether; about 6% soluble in water; 22% soluble in ethylene glycol. Chemical properties: low molecular weight with reactive double bond and a reactive oxirane ring. Suggested uses: for plastics, plasticizers, surfactants, drugs, adhesives, etc. Availability: experimental quantities. Columbia - Southern Chemical Corp., Market Research & Development.

3-n-BUTYL BENZOYLENE UREA (2, 3 diketo 3 n-butyl tetrahydroquinazoline)

$C_{12}H_{14}N_2O_2$; M. W., 218; Sp. G., 98%; M. P., 153 C min. Characteristics: white silky needle crystals. Solubility: soluble in isopropanol. Suggested uses: as a chemical intermediate. Availability: experimental quantities. Maumee Chemical Co.

BUTYL CARBAMATE

$C_4H_9OCONH_2$; M. W., 117; Sp. G., 0.992 (55/55); M. P. 54.2-55 C; Purity, 99.5%. Characteristics: white crystals. Solubility: 2.2% by weight in water at 25 C; insoluble in hexane; soluble in benzene, ethanol and carbon tetrachloride. Suggested uses: as a chemical intermediate; solvent possibilities. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

sec-BUTYL 6-METHYL-3-CYCLOHEXENE CARBOXYLATE

M. W., 196.28; B. P., 109 C to 119 C (15 mm.). Characteristics: a water-white liquid with mild, pleasant citrus odor. Suggested uses: limited experimental purposes as an attractant for Mediterranean fruit fly and of possible interest in the manufacture of perfumes. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

CADMIUM SILICOFLUORIDE (cadmium fluosilicate)

$CdSiF_6 \cdot 6H_2O$; M.W. 362.57; Characteristics: white crystals. Solubility: soluble in water. Suggested uses: in microwave studies. Availability: experimental quantities. City Chemical Corp.

CALCIUM ACID PHYTATE (acidic calcium salt of phytic acid)

Sp. G., 1.38. Characteristics: 50% aqueous solution. Suggested uses: to retard surface discolora-

*Registered trademark.

tion of peeled fruits and vegetables. Availability: semicommercial quantities. A. E. Staley Manufacturing Co., Chemical Division.

CALCIUM TRIMETHYLOLPHENATE (calcium 2,4,6-tris [hydroxymethyl] phenate)

$(CH_2OH)_3C_6H_2$-O-Ca-O-$C_6H_2(CH_2OH)_3$; Sp. G., 1.414 at 20/20C; M.P.,above 300 C. Characteristics: a buff colored powder. Solubility: complete in water at 20C; solubility in organic solvents at 25C: methanol, above 40%; ethylene glycol, above 20%; ethanol, 1.4%; 1-propanol, 0.2%. Chemical properties: reacts with acids liberating free 2,4,6-trimethylolphenol; with alkyl sulfates or active chlorine compounds to form trimethylol-phenyl ethers and tetraethers; with acid chlorides or anhydrides to yield trimethylolphenyl esters and tetraesters. Suggested uses: useful in itself or through trimethylolphenol as a raw material for thermosetting resins by reaction with glycols, polyols, polyamines, sugars and other polyfunctional compounds; insolubilizing agent for starches, sugars, glucosides, glues, gelatins, polyvinyl alcohol, hydroxyethyl cellulose and other water-soluble materials; cross-linking agent and intermediate for epoxy, polyester and polyurethane resins; wet-strengthening agent for paper; binder for powders or granular materials. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

CALCIUM (meta) VANADATE

$Ca(VO_3)_2$; M.W., 237.98. Characteristics: white powder. Solubility: insoluble in water, decomposed by mineral acids. Availability: experimental quantities. City Chemical Corp.

CALCOFAST NEUTRAL RED 6B, NEUTRAL YELLOW 3R, NEUTRAL YELLOW G

Suggested uses: in dyeing and printing wool, silk and nylon textiles; for unions of wool and viscose, wool and acetate, nylon and cotton, nylon and viscose, nylon and acetate, where the wool or nylon is dyed and the other fiber is kept white or is cross-dyed. Availability: commercial quantities. American Cyanamid Co., Organic Chemical Division, Dyes Dept.

CALCOFLUOR® WHITE RW SOLUTION

Constituents: contains brightener and mineral acid solution. Characteristics: a clear amber liquid. Solubility: satisfactory for use in aqueous textile processing baths. Properties: imparts a brighter and whiter tone to wool, nylon, silk, acetate, Orlon and Vicara under daylight illumination and a bright bluish fluorescence under ultraviolet light. Suggested uses: to produce whiter whites; to whiten and brighten backgrounds of printed fabrics; to brighten pastel shades. Availability: commercial quantities. American Cyanamid Co., Organic Chemical Division, Dyes Dept.

CALCOGENE® BLUE 6 RCF SOLUTION

Constituents: solution of sulfur dye, sodium sulfide and other chemicals. Solubility: satisfactory for use in textile dyebaths. Outstanding features: eliminates trouble of dissolving a powder-type dye; very low insolubles; minimized tendency to produce bronzy dyeings; particularly valuable for continuous methods of cloth dyeing and for dyeing stock and yarn in pressure circulating machines. Availability: commercial quantities. American Cyanamid Co., Organic Chemical Division, Dyes Dept.

CALCOLOID® BLACK BNC DOUBLE PASTE

Characteristics: a dispersed vat dye paste; double concentration. Solubility: insoluble in water unless in the form of a sodium leuco compound. Chemical properties: self shade is dull green; aftertreatment of dyeings with sodium hypochlorite or nitrous acid, it gives a fast black shade. Suggested uses: for cotton, silk, or viscose stock, yarn and fabrics; for cotton hosiery with nylon reinforcing yarns. Availability: commercial quantities. American Cyanamid Co., Organic Chemical Division, Dyes Dept.

CALCOLOID® DARK GREEN BNC DOUBLE PASTE

Characteristics: a dispersed vat dye paste, double concentration. Solubility: insoluble in water unless in the form of the sodium leuco compound. Chemical properties: standardized as the green self shade. Suggested uses: for low-cost dull green shades where chlorine fastness is not required and where good, but not outstanding, general fastness is satisfactory; for cotton, silk, viscose. Availability: commercial quantities. American Cyanamid Co., Organic Chemical Division, Dyes Dept.

CAMPHORIC ACID

$C_{10}H_{16}O_4$; M.W., 200; M.P., 185-187C. Characteristics: white crystalline powder, camphor odor. Solubility: in water, 1:125 cold; 1:10, hot; soluble in alcohol, ether, chloroform. Suggested uses: for medicinals. Availability: commercial quantities. Fine Organics Inc.

CATALIN ANTIOXIDANT #5

M. W., 340.49; M. P., 125-133 C. Characteristics: white crystals, slight phenolic odor. Chemical properties: excellent nonstaining and nondiscoloring antioxidant properties; in low concentration it offers economical protection against oxidative degradation and trace-metal contaminants. Suggested uses: for white and light-colored rubber, rubber foams, tires, elastic threads, drug and surgical sundries, footwear, bathing accessories, petroleum hydrocarbons and as an inhibitor of polymerization. Availability: commercial quantities. Catalin Corp. of America, Chemical Division.

CATALIN ANTIOXIDANT #6 (2,2'-thiobis [4-methyl-6-butyl phenol])

M. W., 358.51; M. P., 82-88 C. Characteristics: crystalline powder, off-white. Chemical properties: tremendous staying power when subjected to high temperatures; nonstaining, nondiscoloring properties; used in low concentration. Suggested uses: as an oxidative inhibitor for mineral oils, polyethylene, rubber, oil extended rubber, vegetable fats and oil, waxes, and petroleum hydrocarbons, and other products subject to oxidative degradation. Availability: semicommercial quantities. Catalin Corp. of America, Chemical Division.

CATALIN BACTERIOSTAT CS-1 (2,2'-thiobis [4,6-dichlorophenol])

M. W., 356.07; M. P., 186-189 C; Purity, 97% min. Characteristics: white crystalline powder; slight phenolic odor. Chemical properties: used in low concentration, it is an economical and stable bacteriostat extremely effective in combating body odors and certain complexion faults by inhibiting the growth of skin bacteria. Suggested uses: in soaps, shaving creams, shampoos, cosmetics and pharmaceuticals. Availability: commercial quantities. Catalin Corp. of America, Chemical Division.

CATANAC® SN (stearamidopropyldimethyl-β-hydroxyethylammonium nitrate)

Constituents: 65% active material in paste including 35% of solvent which is 50% isopropyl alcohol and 50% water. M.W., 476; M.P., 36-40C. Characteristics: light amber paste; isopropyl alcohol odor. Solubility: miscible with water, acetone, alcohols and other polar solvents of low molecular weight; sufficiently soluble for effective use in nonpolar systems if heat is employed. Suggested uses: effective for eliminating accumulation of static electrical charge, even in very low concentrations; high degree of compatibility with many systems; as an antistatic agent. Availability: commercial quantities. American Cyanamid Co., New Product Development Dept.

C-29 COMPOUND

Characteristics: brown liquid, 50% active. Solubility: miscible with water or caustic solutions. Chemical properties: acts as sequestering agent for calcium, magnesium, iron and aluminum in alkaline solution. Suggested uses: as a bottle washing additive. Availability: commercial quantities. Blockson Chemical Co., Division of Olin Mathieson Chemical Corp.

CESIUM CARBONATE

CS_2CO_3; M. W. 325.82; Sp. G. apparent density 141 lbs. cu. ft.; M. P. decomposes; Purity: 93% min.; B. P. decomposes. Characteristics: hygroscopic fine colorless crystals. Solubility: 261.5 g./100 g. H_2O at 25 C. Chemical properties: a reactive alkali metal salt. Suggested uses: in the manufacture of other cesium compounds for photoelectric cells and electron-emission cathodes and photocathodes; in the production of photoluminescent materials. Availability: semicommercial quantities American Potash & Chemical Corp., Market Development Dept.

CESIUM CHLORIDE

CsCl; M. W. 168.37; Sp. G. 3.97; M. P. 645 C; Purity: 93% min.; B. P. 1290 C. Characteristics: hygroscopic fine colorless crystals. Solubility: g./100 g. H_2O; 0 C - 161.4; 20 C - 186.5 100 C - 270.5 Chemical properties: reactive alkali metal chloride. Suggested uses: addition to ZnS screens increases absorption of X-rays; in the production of photoluminescent materials; production of cesium metal for photoelectric cells. Availability: semicommercial quantities. American Potash & Chemical Corp., Market Development Dept.

CESIUM FLUORIDE

CsF; M. W. 151.91; Sp. G. 3.59; M. P. 682 C; Purity: 93% min.; B. P. 1250 C. Characteristics: fine colorless crystals. Solubility: 366.5 g./100 g. H_2O at 25 C. Chemical properties: reactive alkali metal fluoride. Suggested uses: in the manufacture of specialty glasses, photoluminescent materials; as a flux for welding. Availability: semicommercial quantities. American Potash & Chemical Corp., Market Development Dept.

CESIUM SULFATE

Cs_2SO_4; M. W. 361.88; Sp. G. 4.24; M. P. 1019 C; Purity: 93% min. Characteristics: hygroscopic fine colorless crystals. Solubility: g./100 g. H_2O: 0 C — 167.1; 20 C — 178.7; 100 C - 220.3. Chemical properties: reactive metal salt. Suggested uses; as a promoter for iron catalyst in ammonia synthesis. Availability: semicommercial quantities. American Potash & Chemical Corp., Market Development Dept.

CETYL TOSYLATE

M.W., 392; M.P., 30 C min.; Purity, over 93% as ester. Characteristics: white, free flowing, crystalline. Chemical properties: this material is available with two different compositions, having a cetyl ester content, based on total ester present, of 80% and 95% respectively; it is a highly reactive alkylating agent that takes part readily in most substitution reactions to introduce the normal hexadecyl group. Suggested uses: as an intermediate for the introduction of the n-hexadecyl group. Availability: commercial quantities. Fine Organics, Inc.

CHEMIGUM LATEX 247 (butadiene-acrylonitrile latex)

Sp. G. .98. Chemical properties: improved resistance to discoloration on exposure to heat and light. Suggested uses: for textile sizing, nonwoven fabric binder, paper saturant, printing inks, plasticizer for vinyl latex. Availability: commercial quantities. Goodyear Tire & Rubber Co., Chemical Division.

CHEMIGUM N8 (butadiene acrylonitrile copolymer)

Constituents: 33% acrylonitrile, 67% butadiene. Sp. G., 1.00. Characteristics: solid bale form; straw color; characteristic mild, pleasant odor. Chemical properties: low nerve, oil resistant copolymer. Suggested uses: excellent for mill breakdown, die reproduction for extrusions, and calendered stocks; can be used alone or in combination with other polymers to obtain desired smoothness. Availability: commercial quantities. Goodyear Tire & Rubber Co., Chemical Division.

CHEMOCIDE HK (heptyl p-hydroxybenzoate)

C_7H_5O. $C_7H_5O_2$; M.W., 236; M.P., 44 C; Purity 99%. Characteristics: white, odorless powder. Solubility: insoluble in water; soluble in most organic solvents, fixed oils and polyols. Chemical properties: fungicide more effective than the lower esters of p-hydroxybenzoic acid. Suggested uses: as a fungicide for soaps and cosmetics; preservative for drugs and cosmetics. Availability: semicommercial quantities. Chemo Puro Mfg. Corp.

CHEMOCIDE LPL (polychlorophenyl dodecanoate)

$C_{18}H_{24}O_2Cl_5$; M.W., 448; Sp. G., 1.25; Purity, 98%. Characteristics: clear, amber, odorless liquid. Solubility: insoluble in water, soluble in most organic solvents and plasticizers. Chemical properties: superior fungicide which can replace copper 8-hydroxyquinolin. Suggested uses: rotproofing of textile fabrics and yarns, plastics; preservative for paints. Availability: semicommercial quantities. Chemo Puro Mfg. Corp.

CHEMOCIDE PCMS (sodium p-chlor-m-cresolate trihydrate)

C_7H_6ClONa. $3H_2O$; Constituents: contains p-Chlor-m-cresol 66%; M. W., 212; M. P., min. 90 C; Purity, 98%. Characteristics: off-white granules of slight odor. Solubility: soluble in cold and hot water; decomposed by mineral & organic acids. Chemical properties: highly water-soluble. Suggested uses: as a preservative, fungicide and bactericide in aqueous systems (adhesives, glues, protein solutions). Availability: semicommercial quantities. Chemo Puro Mfg. Corp.

CHEMOCIDE SAD (dispersible salicylanilide)

$C_{13}H_{11}NO_2$; Constituents: contains 98% salicylanilide; M. W., 213; Characteristics: white, odorless powder. Solubility: insoluble, but readily dispersible in cold or hot water. Chemical properties: unlike pure salicylanilide, product can be used in aqueous systems. Suggested uses: for fungus-proofing textiles. Availability: semicommercial quantities. Chemo Puro Mfg. Corp.

CHEMOCIDE SAS (sodium salicylanilide trihydrate)

$C_{13}H_{10}NO_2Na$; Constituents: 74% salicylanilide; M. W., 235; M. P., min. 210 C; Purity, 98% Characteristics: light tan granules. Solubility: very soluble in cold and hot water; decomposed by mineral and organic acids. Suggested uses: as a fungicide for latex-based (and other water-formulated) paints. Availability: semicommercial quantities. Chemo Puro Mfg. Corp.

NEW CHEMICALS FOR INDUSTRY

CHEMOCIDE XK (hexyl p-hydroxy benzoate)

$C_6H_{13}O{\cdot}C_7H_5O_2$; M. W., 222; M. P., 52 C; Purity, 99%. Characteristics: white, odorless powder. Solubility: insoluble in water; soluble in most organic solvents, fixed oils and polyols. Chemical properties: a fungicide more effective than the lower esters of p-hydroxybenzoic acid. Suggested uses: fungicide for incorporation in soaps and toilet goods; preservative for drugs and cosmetics. Availability: semicommercial quantities. Chemo Puro Mfg. Corp.

81644 CHLORINATED SILICONE FLUID

Chemical properties: silicone fluid with improved resistance to oxidation; able to operate in air at 510F, some 100 degrees higher than previous fluids; possesses improved lubricity. Suggested uses: as a lubricating fluid for turbines and for other high-temperature fluid uses. Availability: commercial quantities. General Electric Co., Silicone Products Dept.

81717 CHLORINATED SILICONE FLUID

Chemical properties: a better lubricant at 700 F than any known fluid. Suggested uses: as a high-temperature fluid for hydraulic systems. Availability: commercial quantities. General Electric Co., Silicone Products Dept.

CHLOROSULFONIC ACID

$HOSO_2Cl$; M. W. 116.52; Sp. G., 1.787 at 25 C; M.P. —80 C; Purity, 99%; B.P. 150-151 C. Characteristics: colorless liquid with a pungent odor. Solubility: decomposed by water and alcohol; insoluble in carbon disulfide. Suggested uses: to introduce a sulfonyl chloride group into an aromatic ring. Availability: semicommercial quantities. The Matheson Company, Inc., Matheson Coleman & Bell Division.

CIBACRON (dye series)

Characteristics: colored powders. The Cibacron dyes present a radically new means of dyeing and printing cotton, rayon and silk through chemical reaction with the fiber. Unlike dyeing by physical adsorption or mechanical retention, the Cibacrons develop a chemical bond between a chlor-atom of the dye and the hydroxyl radical of the fiber. Readily soluble in water, the dyes have no affinity for textile fibers until fixed in an alkaline, salt bath. Subsequent washing removes unbound dye for brilliant, beautiful shades of excellent fastness. Applied primarily by padding and printing methods, employing three general steps of padding, fixation and washing. Suitable principally for woven piece goods, such as dress goods, shirtings and linens. Commercially available in eight initial colors, from yellow and orange through scarlet, red and rubine to blue and turquoise. Availability: commercial quantities. CIBA Co. Inc.

CIRKAL*

Chemical properties: highly alkaline, nonfoaming chlorinated alkaline detergent. Characteristics: uniform white to slightly yellow powder with a mild chlorinous odor; rapidly soluble; prevents milkstones. Suggested uses: in place cleaning of dairy equipment. Availability: commercial quantities. Diamond Alkali Co., Silicate-Detergent-Calcium Division.

CITRACONIC ANHYDRIDE (methylmaleic anhydride)

$C_5H_4O_3$; M. W. 112.10; Sp. G. 1.23-1.25 at 25C; M. P. 7-8C; Purity: greater than 96%; B. P. 213-214C. Characteristics: colorless to light yellow liquid with a slight acetic odor; like most anhydrides, it is a skin irritant. Solubility: soluble in chloroform, acetone, ether and benzene; insoluble in hexane; slowly hydrolyzes in water to citraconic acid which is quite water soluble. Chemical properties; a liquid anhydride that will undergo most of the common reactions of acid anhydrides. Suggested uses: as an expoxy resin curing agent; preparation of specialty polyesters; as a chemical intermediate. Availability: experimental quantities. Chas. Pfizer & Co., Inc. Commercial Development Division.

CL-104 POLYVINYL ACETATE EMULSION

Chemical properties: shows good block resistance under moist, sterilizing conditions; maintains workable viscosity at relatively high pigment loading. Suggested uses: as a binder for nonwoven fabrics; binder for clay coatings on paper; grease resistant paper coatings and adhesives. Availability: commercial quantities. Celanese Corp. of America, Plastics Division.

CMS (carboxy-methyl-cellulose)

Characteristics: slightly off-white powder. Solubility: insoluble in water and caustic. Chemical properties: ion exchanger. Suggested uses: for protein separation. Availability: semicommercial quantities. Brown Co., Research and Development Dept.

COPPER HYDRATE COMPLEX(CHC-Type 1)

Constituents: contains chemically bound PO_4 and SO_4 radicals in controlled proportions. $[Cu(OH)_2]_{100} \cdot [PO_4]_{2.6} \cdot SO_4$; M.W. approx. 10,250; Sp. G. 6.0-6.5; M.P. rapidly changes to $CuO \cdot H_2O$ complex above 100 C; Purity: technical grade. Characteristics: odorless, light blue powder (0.5-5.0 microns); bulk density—.45 g./cc. Solubility: 0.7×10^{-6} g./l. in distilled water at 25 C. Chemical properties: unusually toxic to rodents, molluscs, and barnacles (detailed test results available); completely dissolves regenerated cellulose in ammoniacal solutions within an hour; X-ray studies show $Cu(OH)_2$ structure; unlike most copper hydrates, the material has a shelf life of more than two years. Suggested uses: in dry insecticidal and fungicidal mixtures, suspensions (paints and sprays); impregnation of wood as a preservative; formulation in concrete and plasters to decrease permeability and to prevent molds. Availability: commercial quantities. Henry Bower Chemical Mfg. Co.

COPPER (meta) VANADATE

$Cu(VO_3)_2$; M. W., 261.44. Characteristics: yellow powder. Solubility: insoluble in water, decomposed by mineral acids. Availability: experimental quantities. City Chemical Corp.

CRAG* SEVIN* EXPERIMENTAL INSECTICIDE (1-naphthyl-N-methylcarbamate)

M.W. 201.22; Sp. G., 1.232 at 20/20C; M.P. 142C. Characteristics: a white crystalline powder. Chemical properties: Sevin experimental insecticide is unusual in that it contains no phosphorus or chlorine, generally found in organic insecticides. Suggested uses: in tests to date, Sevin has provided effective control of codling moth, red-banded leaf roller, apple aphids, plum curculio and apple maggot in normal apple spray schedules. It is outstanding in the control of Mexican bean beetle and Colorado potato beetle and shows definite promise against pink bollworm, bollworm and boll weevil on cotton. It is also being tested on forage, tobacco and ornamentals. Availability: semicommercial quantities for experimental use only on fruit, cotton and vegetables. Union Carbide Corp., Union Carbide Chemicals Co. Division.

CROSS-LINKED KURROL'S SALT (cross-linked)

$(KPO_3)n$; M W., 200,000-2,000,000; M.P., 450-550 C. approx; Purity, food grade; B. P., decomp. > 1400 C. Characteristics: white crystals or powder. Solubility: insoluble in water except in the presence of other alkaline earth cations. Chemical properties: correctly prepared dilute solutions have high transient viscosities: 0.1%—200 cp., 1.0%—2000 cp.; viscosity half life: 25 C.—90 hrs., 60 C.—1.0 hr. Suggested uses: for short term suspension of solids; as long term sequestrant and dispersant where slow solubilizations from cationic concentration in water occurs. Availability: semicommercial quantities. Monsanto Chemical Co., Inorganic Chemicals Division.

CUMYLPHENOL (p-[phenylisopropyl]phenol)

$C_{15}H_{16}O$; M.W. 212.28; M.P. 72.0; Purity: 97.0%. Characteristics: white to light tan crystals with a characteristic phenolic odor. Solubility: soluble in alcohol, ether, benzene, xylene; insoluble in water. Chemical properties: reacts with carbonyl and epoxy compounds to form resins; forms salts with bases, esters with acids, phenoxides with alkali metals, polymers with sulfur chlorides, and colored diazo compounds with diazonium salts; undergoes substitution and addition reactions of an alkylated benzene; undergoes the Fries rearrangement to form ortho-hydroxy ketones. Suggested uses: in synthetic resins; lubricating oil additives; chemical intermediates. Availability: commercial quantities. Allied Chemical & Dye Corp., Barrett Division.

CYANALUBE TSI SOFTENER

Constituents: nonionic emulsion of polyethylene. Characteristics: translucent tan liquid. Solubility: disperses readily in cold water. Chemical properties: compatible with most types of textile finishing agents. Suggested uses: as a softener for improving tear strength of resin-treated fabrics. Availability: commercial quantities. American Cyanamid Co., Organic Chemicals Division.

CYANAMER* POLYACRYLAMIDE PAM 10 (polyacrylamide)

M.W., 38,500 to 48,500; Purity, 95-98% solids. Characteristics: available as an amber liquid having 40% solids (approx.). Solubility: soluble in water. Chemical properties: readily soluble, easily rendered insoluble after application; enters into reactions typical of amide group; possesses excellent compatibility with electrolytes; viscosities of solutions having pH of 2-9 change very little on storage. Suggested uses: in formulations where high solids with low viscosities are required; in adhesives, protective colloids in vinyl polymerizations, useful where water-soluble material which can be made insoluble on application is needed. Availability: semicommercial quantities. American Cyanamid Co., New Product Development Dept.

CYANAMER* POLYACRYLAMIDES PAM 200 (polyacrylamide)

M.W., approximately 2 million; Purity, 97 to 99%. Characteristics: white, free-flowing powder. Solubility: soluble in water. Chemical properties: readily soluble, easily rendered insoluble after application; enters into reactions typical of amide group; possesses excellent compatibility with electrolytes; viscosities of solutions having pH of 2-9 change very little on storage. Suggested uses: protective colloid for emulsion polymerizations, etc., additive to adhesive formulations to improve spreadability and initial tack, thickening agent for water base paints, and thickening agent where high thickening efficiency is required; useful where water-soluble material that can be made insoluble on application is needed. Availability: commercial quantities. American Cyanamid Co., New Product Development Dept.

CYANATEX 3130 SOFTENER

Constituents: mixture of stearic derivatives. Characteristics: white paste. Solubility: disperses readily in water at 100-120 F. Chemical properties: resistant to color and odor formation; economical. Suggested uses: as a finish for cotton yarn and fabric. Availability: commercial quantities. American Cyanamid Co., Organic Chemicals Division.

2-CYANOETHYL ACRYLATE

$CH_2{:}\ CHCOOCH_2CH_2CN$; M.W., 125.12; Sp. G., 1.062 at 20/20C; B.P., 103 C at 10 mm. Chemical properties: will homopolymerize or copolymerize with acrylonitrile, styrene, acrylic esters and vinyl esters; will add to compounds with active hydrogens, thus providing a means of introducing the cyanoethyl group, which can be hydrolyzed to the carboxylic acid or hydrogenated to the amine. Suggested uses: in the preparation of synthetic resins, fibers and pharmaceuticals. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

CYANOGEN (ethanedinitrile, oxalonitrile)

C_2N_2 ($N{\equiv}C{-}C{\equiv}N$); M.W., 52; M.P., (—)27.9 C; Purity, 99.5%; B. P., —21.2 C. Characteristics: colorless gas, pungent odor. Solubility: dissolves in four volumes of water and 26 volumes of alcohol. Chemical properties: very reactive; strongly exothermic in reactions; inflammable; produces flames of very high temperatures. Suggested uses: as an intermediate in chemical syntheses; propellent; welding; cutting tool; flame photometry. Availability: semicommercial quantities. American Cyanamid Co., New Product Development Dept.

1,5-CYCLOOCTADIENE

C_8H_{12}; M. W., 108.176; Sp. G., 0.88132 at 20/4; M. P., —69.20 C; B. P., 148.9-150.0 C. Suggested uses: as a laboratory standard; for organic syntheses. Availability: experimental quantities. Phillips Petroleum, Special Products Division.

CYTIDINE-2-C^{14}

$C_8C^{14}H_{13}O_5N_3$; M.W. 243.2; Purity: radiochemically pure (by chromatography). Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

CYTIDYLIC ACID-2-C^{14}, MIXED ISOMERS 2' and 3'

$C_8C^{14}H_{14}O_8N_3P$; M.W. 323.2. Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

*Registered trademark.

DAC-559°
(tetrachloroglycoluril)

M.W., 279.92; M.P., 166 C. Characteristics: white powder with slight chlorine odor. Solubility: 0.03 gm. in 100 gm. water at 25C. Chemical properties: 95% available chlorine content (typical); good stability. Suggested uses: as a dry bleach for laundry use; bactericide. Availability: semicommercial quantities. Diamond Alkali Co., Central Research Laboratory.

DAC-595
(dichloroglycoluril)

M.W., 211.02; M.P., 176C, Characteristics: white powder with slight chlorine odor. Solubility: 0.5 gm. in 100 gm. water at 25C. Chemical properties: 65% available chlorine content (typical); good stability. Suggested uses: as a dry bleach for laundry use; sanitizer. Availability: semicommercial quantities. Diamond Alkali Co., Central Research Laboratory

DEAE
(diethylaminoethyl cellulose)

Purity, reagent and technical. Characteristics: off-white powder. Solubility: insoluble in water. Chemical properties: ion exchanger, especially useful in protein isolation. Suggested uses: in enzyme purification, blood fractionation, other protein separations. Availability: semicommercial quantities. Brown Co., Research and Development Dept.

DECYL ALCOHOL (INHIBITED)

Constituents: decyl alcohol containing inhibitor. $C_{10}H_{22}O$; M.W., 158.28; Sp. G. 0.835 at 20/20C; Purity, 99%, min.; B.P. 215-225C. Characteristics: colorless liquid, characteristic odor. Solubility: soluble in organic solvents, insoluble in water. Chemical properties: inhibitor protects alcohol during acid catalyzed esterification against color formation; yields very light-colored esters requiring little or no decolorizing. Suggested uses: esters for plasticizer use. Availability: commercial quantities. Enjay Co., Inc. Chemicals Division.

iso-DECYL AMINE

$C_{10}H_{23}N$; M.W., 157.30; Sp. G., 0.8040 at 20/20C; B.P., 203.7C (760 mm); 115C (50 mm); 78C (10 mm). Solubility: in water at 20C, 0.05% by weight. Chemical properties: a light colored liquid that is a mixture of decylamine isomers. Suggested uses: as an intermediate for the preparation of corrosion inhibitors, petroleum specialties, rubber chemicals, insecticides, pharmaceuticals, surfactants and dyestuffs. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

n-DECYL TOSYLATE
(n-decyl P-toluenesulfonate)

M.W., 308; M.P., 5-8C; Purity, over 93%. Characteristics: mobile, pale yellow liquid, slight odor. Solubility: insoluble in water, soluble in most common organic solvents. Chemical properties: this highly reactive alkylating agent (more reactive than decyl iodide) takes part readily in most substitution reactions to introduce the n-decyl group. Suggested uses: as an intermediate to introduce the decyl group under mild conditions. Availability: commercial quantities. Fine Organics, Inc.

2-DEOXY-d-RIBOSE, CRYSTALLINE

$C4H_{10}O_4$; M.W. 134.1; M.P. 78-82 C. Characteristics: white, crystalline solid. Solubility: readily soluble in water giving clear solutions. Suggested uses: in biochemical and nutritional research. Availability: commercial quantities. Schwarz Laboratories, Inc.

DET
(n,n- diethyl-m-toluamide)

$m\text{-}C_6H_4(CH_3)\ CO \cdot N\ (C_2H_5)_2$; M.W. 191; Sp. G. 1.001; Purity; 95% meta isomer. Characteristics: clear oily liquid, with characteristic mild odor. Solubility: soluble in most organic solvents. Suggested uses: as an insect repellent base. Availability: commercial quantities. Montrose Chemical Co.

DETAMIDE-95 (DET)
(MM.diethyltoluamide)

$CH_3C_6H_4CON(C_2H_5)_2$; M.W., 191.26; Sp. G., 0.999; Purity, 95+% meta; B.P., 111C at 1 mm. Characteristics: a colorless liquid with a mild, pleasant odor. Suggested uses: broad spectrum, long-lasting insect repellents; paint remover; plastic solvent; plasticizer. Availability: commercial quantities. Cowles Chemical Co., Organic Chemical Dept.

DIALLYLAMINE (di [2 propenyl] amine)

$(CH_2{=}CH_2{-}CH_2)_2NH$; M. W. 97.16; Sp. G. 0.7874 (pure compound); M. P. —88.4 C. B. P. 110.4 C. Solubility: in water 8.6% by weight complete in toluene, acetone and octane. Chemical properties: enters into reactions typical of secondary amines and offers the additional activity of two double bonds; will readily form amides, imides and carbamates with suitable reagents; double bonds may be copolymerized with other monomers or addition compounds made. Suggested uses: reacted with diethylene amine to produce a water repellant resin; intermediate for neoprene rubber plasticizers; carbamate derivative as rubber vulcanizer accelerator; dyestuffs, pharmaceuticals and agricultural chemicals. Availability: semicommercial quantities. Shell Chemical Corp. Market Development Dept.

DIALLYL CARBONATE

$CO(OCH_2CHCH_2)_2$; M.W., 142; Sp. G., 1.0006 (20/20 C); Purity, 99.4%; B.P., 105 C (100 mm.); 88 C (50 mm.) Characteristics: water-white liquid. Solubility: insoluble in water; soluble in hexane, benzene, ethanol and carbon tetrachloride. Suggested uses: as a solvent; monomer; chemical intermediate. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

DIALLYL CHLOROMETHYLPHOSPHONATE

$ClCH_2PO(OCH_2CH_2)_2$; M.W., 210.5; Sp. G., 1.1870 at 25/25 C; Purity, 98+%; B.P. 87 C at 1 mm. Characteristics: water white to light yellow liquid. Solubility: soluble in common organic solvents; slightly soluble in water. Chemical properties: polymerizes with peroxide catalyst to a hard, strong, thermosetting self-extinguishing resin; compatibly polymerizes with vinyl acetate, methyl methacrylate, diallyl phthalate and unsaturated polyesters; copolymers are characterized by their excellent optical properties, solvent resistance, hardness and flame resistance; copolymers containing 10-30% by weight of product are rendered self-extinguishing. Suggested uses: polymers and copolymers are suitable for laminating and casting applications. Availability: experimental quantities. Victor Chemical Works, Special Products Division.

DIALLYL ETHER

$CH_2{=}CH\text{-}CH_2\text{-}O\text{-}CH_2\text{-}CH{=}CH_2$; M. W. 98.14 (pure compound) Sp. G. 0.805; Purity: 95% minimum; B. P. 94.8 C. Characteristics: mobile colorless liquid. Solubility: slightly soluble in water; infinitely soluble in ether and alcohol. Chemical properties: reactions of diallyl ether in general are much slower than those of allyl alcohol; hydroxylation of diallyl ether results in diglycerol; chlorohydrination leads to the di (chlorohydrin) which can be converted to diglycidyl ether; an additional product is formed by the reaction of diallyl ether and hydrogen sulfide. Suggested uses: diallyl ether is suggested for consideration as an intermediate for the preparation of compounds which may be useful in surface coatings, rubber chemicals, synthetic lubricants, and pharmaceuticals. Availability: experimental quantities. Shell Chemical Corp. Market Development Dept.

1,3-DIAMINO PROPANE

$H_2NCH_2CH_2CH_2NH_2$; M.W., 74.13; Sp. G., 0.884 at 25/4C; B.P., 138C (735 mm); 67C (50 mm). Characteristics: a water-white liquid. Solubility: completely soluble in water, methanol and ethyl ether. Chemical properties: undergoes reactions typical of primary amines. Suggested uses: as an intermediate in the production of textile resins, ion exchange resins, dyestuffs, rubber chemicals, pharmaceuticals, surface-active agents, corrosion inhibitors and insecticides. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

DIBUTYL CARBONATE

$CO(OC_4H_9)_2$; M.W., 174; Sp. G. 0.9255 (20/20C); Purity, 99.5%; B.P. 206-207.5 C. Characteristics: water-white liquid. Solubility: 0.05% by weight at 25 C in water; soluble in hexane, benzene, ethanol, carbon tetrachloride. Suggested uses: as a solvent; monomer; chemical intermediate. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

DIBUTYL CHLOROMETHYLPHOSPHONATE

$ClCH_2PO(OC_4H_9)_2$; M.W., 242.5; Sp. G., 1.0782 at 25/25C; M.P., very viscous at —70 C. Purity, 98+%; B.P. 101 C at 1.5 mm. Characteristics: colorless liquid. Solubility: soluble in most organic solvents; insoluble in water. Suggested uses: as a plasticizer for cellulose acetate, ethyl cellulose, nitrocellulose and vinyl resins; imparts flame resistance to vinyl and cellulose acetate plastics; incorporation in polyester resins will render them flame resistant. Availability: experimental quantities. Victor Chemical Works, Special Products Division.

4,4'-DICHLOROBENZOPHENONE

$(4\text{-}ClC_6H_4)_2CO$; M.W., 251.12; M.P., 147-148.5 C; Purity, 98+%; Characteristics: colorless leaflets from ethanol. Suggested uses: as an intermediate. Availability: experimental quantities. Diamond Alkali Co., Chlorinated Products Division.

4,4'-DICHLORODIPHENYLMETHANE

$C_{13}H_{10}Cl_2$; M.W., 237; M.P., 55 C; Purity, 98+%; Characteristics: colorless needles from methanol. Suggested uses: as an intermediate. Availability: experimental quantities. Diamond Alkali Co., Chlorinated Products Division.

4,4'-DICHLORODIPHENYLSULFONE

$C_{12}H_8Cl_2O_2S$; M.W., 287; M.P., 140-144 C; Purity, 95-97%. Solubility: insoluble in water; soluble in acetone, carbon tetrachloride and xylene. Suggested uses: as an intermediate in organic synthesis. Availability: semicommercial quantities. Diamond Alkali Co., Chlorinated Products Division.

2,5-DICHLORO-4-NITROPHENOL

$C_6H_3Cl_2NO_3$; M.W., 208; M.P., 117 C; Purity, 98+%. Characteristics: yellow crystalline solid, odorless. Solubility: at least 5% in water, acetone, cyclohexanone and xylene. Suggested uses: as a larvicide. Availability: experimental quantities. Diamond Alkali Co., Central Research Laboratory.

3,4-DICHLOROTETRAHYDROTHIOPHENE-1, 1-DIOXIDE

M.W., 189.1; M.P., 90-110 C, Purity, 95%; B.P. 186 C (10mm.). Characteristics: light tan crystalline solid with a very low vapor pressure; odorless. Chemical properties: unstable in presence of alkali. Suggested uses: as a chemical intermediate. Availability: semicommercial quantities. Diamond Alkali Co., Central Research Laboratory.

DICYCLOPENTADIENE (High Purity)

$C_{10}H_{12}$; M.W., 132.20; Sp. G., 0.970 at 20/20 C.; Purity, 95% min. Solubility: soluble in organic solvents; insoluble in water. Chemical properties: a source for cyclopentadiene by cracking; raw material for resins; plastics; metallo-organics; insecticides; polybasic acids. Availability: commercial quantities. Enjay Co., Inc., Chemicals Division.

DIDODECYL CARBONATE
(dilauryl carbonate)

$CO(OC_{12}H_{25})_2$; M.W., 398; Sp. G., 0.8803 (at 20/20 C); Purity, 99.0%; B. P. 215 C (1 mm.). Solubility: soluble in hexane, benzene, ethanol and carbon tetrachloride. Suggested uses: as a solvent; monomer; chemical intermediate. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

2,6-DI-ETHYLANILINE

$(C_2H_5)_2C_6H_3NH_2$; M.W., 149.2; Purity, 98+%; B.P. 243 C. Solubility: completely miscible with most organic solvents; insoluble in water. Chemical properties: bifunctional aromatic compound wherein the chemical reactivity of amino group is modified. Suggested uses: as a chemical intermediate for pharmaceuticals, dyestuffs, pesticides, antioxidants, and other organic products. Availability: semicommercial quantities. Ethyl Corp., Business Research Division.

DI-2-ETHYLHEXYL CARBONATE

$CO(OC_4H_9CHC_2H_5CH_2)_2$; M.W., 286; Sp. G.,0. 8977 (at 20/20 C); Purity, 99.5%; B.P. 171-173 C. Characteristics: water-white liquid. Solubility: 0.04% by weight at 25 C in water; soluble in hexane, benzene, ethanol, carbon tetrachloride. Suggested uses: as a solvent; monomer; chemical intermediate. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

DI(2-ETHYLHEXYL) CHLOROMETHYLPHOSPHONATE

$ClCH_2PO(OC_8H_{17})_2$; M.W., 354.5; Sp. G., 0.995 at 25/25 C; M.P. very viscous at —70 C; Purity, 98+%; B.P. 155 C at 1 mm. Characteristics: colorless liquid. Solubility: soluble in most organic solvents; insoluble in water. Suggested uses: plasticizer for ethyl cellulose, nitrocellulose and vinyl resins; imparts exceptional low temperature flexibility to vinyl films. Availability: semicommercial quantities. Victor Chemical Works, Special Products Division.

0,0-DIETHYL PHOSPHOROCHLORIDOTHIOATE

$(C_2H_5O)_2P(S)Cl$; M.W., 189; Sp. G., 1.20 at 25/25 C; Purity, 97% min.; B.P. 95-97 (25 mm.). Characteristics: clear yellow to amber liquid with penetrating odor. Solubility: hydrolyzes in water; soluble in inert organic solvents such as chloroform, benzene, and ether. Chemical properties: an active acyl halide; reactive toward alcohols, amines, thiols and displaceable hydrogens. Suggested uses: as a chemical intermediate for preparation of insecticides and

NEW CHEMICALS FOR INDUSTRY

agricultural chemicals. Availability: commercial quantities. Monsanto Chemical Co., Organic Divisiotl.

DIGLYCOL CHLOROFORMATE
(diethylene glycol bis chloroformate)

$C_6H_8O_5Cl_2$; M.W., 231.0; Sp. G., 1.389; M.P. 5.3-5.7 C; Solubility: miscible in alcohol, acetone, ethyl acetate, ether, diethylene glycol, chloroform, and benzene; immiscible with monoethylene glycol and petroleum ether; about 0.3% soluble in water. Chemical properties: two very reactive chloroformate groups in terminal positions. Suggested uses: for plastics, plasticizers, crosslinkers, etc. Availability: semicommercial quantities. Columbia-Southern Chemical Corp., Market Research & Development Division.

DIHYDROXYCYCLOPENTENES

$C_5H_8O_2$; Constituents: a mixture of cis and trans isomers of 3,4- and 3,5-dihydroxycyclopentenes; M.W., 100.1; Sp. G., 1.157; M.P., ca. —28 C; B.P., 75-125 C. Solubility: soluble in water, alcohol, acetone, dioxane, ethyl acetate; soluble to about 1% in benzene and chloroform. Chemical properties: two reactive secondary hydroxyl groups and a polymerizable double bond. Suggested uses: in plastics, plasticizers, surfactants, lubricants, drugs, adhesives, flotation agents, coating compositions, etc. Availability: experimental quantities. Columbia-Southern Chemical Corp., Market Research & Development Division.

DIISOBUTYLENE

C_8H_{16}; M.W., 112.1; Sp. G., .720-.722 at 60 F; Purity 95%; B.P. 99 C (initial). Characteristics: liquid, water white. Chemical properties: behaves as an olefin. Suggested uses: alkylate detergent; OXO process; depolymerization. Availability: commercial quantities. Petro-Tex Chemical Corp.

DIISOPROPYLBIPHENYL

$[(CH_3)_2CH]_2\ C_{12}H_8$; M.W., 238 (approx.); Sp. G., 0.953 at 25 C; M.P., —31 C; Purity, mixed isomers; B.P., 321-333 C. Characteristics: clear, slightly amber liquid. Chemical properties: a radiation resistant compound with a fluid range of —30 F to +610 F. Suggested uses: as a chemical intermediate; heat exchanger fluid where a pure hydrocarbon with excellent radiation resistance, thermal stability, and/or electric characteristics are required; plasticizer and high-temperature and radiation-resistant dielectric. Availability: semicommercial quantities. Monsanto Chemical Co., Organic Division.

2,6-DIISOPROPYLPHENOL

$(C_3H_7)_2C_6H_3OH$; Sp. G., 0.955 at 25 C; Purity, 98+%; M.W., 178.3; B.P., 242 C; Freezing Pt., 18 C. Solubility: insoluble in water; completely miscible with most organic solvents. Chemical properties: unique combination of the phenolic hydroxyl group with the two blocked ortho positions, giving a compound of modified phenol activity. Suggested uses: as a chemical intermediate for synthetic resins, plasticizers, surfactants, and other products. Availability: commercial quantities. Ethyl Corp., Business Research Division.

2,2-DIMETHOXYPROPANE, 98%

$C(CH_3)_2(OCH_3)_2$; Sp. G., 0.849 at 25/25 C; F.P., —47 C; Purity, >98%; B.P., 76-82 C. Characteristics: water-clear liquid with pleasant odor. Solubility: soluble in organic solvents; moderately soluble in water. Outstanding features: the rapid, rather complete endothermic hydrolysis that the product undergoes. Suggested uses: as a dehydrating agent for low concentrations of water; solvent for specialized applications. Availability: commercial quantities. Dow Chemical Co., Technical Service and Development Division.

DIMETHYLACETAMIDE
(n,n-Dimethylacetamide)

$CH_3CHN(CH_3)_2$; M.W., 87; Sp. G., 0.941-0.945; B.P. 164-167 C. Characteristics: clear, colorless liquid of characteristic odor. Solubility: miscible with most organic solvents and water. Suggested uses: an excellent solvent for many organic materials; useful as a reaction medium. Availability: semicommercial quantities. Eastern Chemical Corp., Development Dept.

DIMETHALLYL CARBONATE

$CO(OCH_2C(CH_3)CH_2)_2$; M.W., 170; Sp. G., 0.9711 (at 20/20 C); Purity, 99.5%; B.P. 199-202.5 C. Solubility: 0.08% by weight in water at 25 C; soluble in hexane, benzene, ethanol and carbon tetrachloride. Suggested uses: as a solvent; monomer; chemical intermediate. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

2-DIMETHYLAMINO-2-METHYL-1-PROPANOL (DMAMP)

M. W., 117.19; M.P., 18.9 C; B. P. at 18 mm. 59-61C; at 760 mm. 159-161 C Solubility: soluble in water, methanol, butanol, acetone, ethyl acetate, benzene, hexane, castor oil and USP mineral oil. Suggested uses: DMAMP is a new compound for use as a catalyst in polyurethane foam as formation and as a stabilizer in modified alkyd resin systems; also suggested for use as a vapor-phase corrosion inhibitor, as a curing agent for epoxy resins, and as an emulsifying agent in the form of its fatty acid soaps; it offers possibilities in the synthesis of compounds with anesthetic, antispasmodic and other useful pharmacological properties. Availability: experimental quantities. Commercial Solvents Corp., Market Development Dept.

DIMETHYL CARBONATE

$CO(OCH_3)_2$; M.W., 90; Sp. G., 1.0718 (at 20/20 C); Purity, 99.5%; B.P. 89.5-90.2 C. Characteristics: water-white liquid. Solubility: 12.0% by weight at 25 C in water; soluble in hexane, benzene, ethanol, carbon tetrachloride. Suggested uses: as a solvent; monomer; chemical intermediate. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

2,2-DIMETHYL-4-CYANOBUTYRALDEHYDE

M.W., 113; Sp. G., at 20/4 C., 0.9647; B.P. 93.5 C. at 5 mm. Characteristics: pale yellow liquid. Solubility: miscible with alcohol, acetone, ether and benzene; insoluble in water and pentane. Availability: experimental quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

cis and trans-1,2-DIMETHYLCYCLOHEXANE

C_8H_{16}; M.W., 112.208; Sp. G., 0.788 at 20/4 C; M.P. —14.529 C; Purity, pure grade—99 mol per cent min.; B.P. 129.1 C. Suggested uses: in organic syntheses. Availability: experimental quantities. Phillips Petroleum, Special Products Division.

2,2-DIMETHYLPENTANOL

M.W., 116.2; B.P. 150 C. at 760 mm. Characteristics: colorless liquid. Chemical properties: undergoes the reactions typical of alcohols; good stability to dehydration. Suggested uses: terminating agent for polyesters and other applications where dehydration might be a problem. Availability: semicommercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

DIMETHYL PHOSPHOROCHLORIDOTHIONATE

$(CH_3O)_2\ PSCl$; M.W., 160.5; Sp. G., 1.320 at 25/25 C; Purity, 95+%; B.P. 66-67 C at 16 mm. Characteristics: light yellow to amber liquid. Solubility: insoluble in water; sparingly soluble in hexane; soluble in alcohol, benzene, acetone, carbon tetrachloride and phosphorus chlorides; hydrolyzes slowly in basic solutions at room temperature, hydrolyzes very slowly in water. Chemical properties: typical reactions of phosphorus chloride; thermally stable at temperatures up to 100 C; slowly isomerizes at 100 C; decomposes violently at above 140 C. Suggested uses: intermediate for insecticides, pesticides, fungicides, oil additives, plasticizers, rubber accelerators, flame retardants and flotation agents. Availability: commercial quantities. Victor Chemical Works, Special Products Division.

0,0-DIMETHYL PHOSPHOROCHLORIDOTHIOATE

$(CH_3O)_2P(S)Cl$; M.W., 161; Sp. G., 1.31 at 25/25 C; Purity, 96% min.; B.P. 56-58 C at 10 mm. Characteristics: light-yellow liquid with penetrating odor. Solubility: hydrolyzes in water; soluble in inert solvents such as chloroform, benzene, heptane and ether. Chemical properties: an active acyl halide; reactive toward alcohols, amines, thiols and displaceable hydrogens. Suggested uses: as a chemical intermediate for preparation of insecticides and agricultural chemicals. Availability: commercial quantities. Monsanto Chemical Co., Organic Division.

DINONYL ADIPATE
(bis-2-propyl-4-methylpentyl adipate)

$C_{24}H_{46}O_4$; M.W., 399.61. Characteristics: essentially colorless and odorless. Chemical properties: low density, low temperature PVC plasticizer. Suggested uses: PVC plasticizer in calendered, extruded and plastisol formulations. Availability: semicommercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

DINONYL AZELATE
(bis-2-propyl-4-methylpentyl azelate)

$C_{28}H_{54}O_4$; M.W., 455.71; Characteristics: essentially odorless, low colored liquid. Chemical properties: good low temperature performance with low density. Suggested uses: PVC plasticizer for extruded, calendered and plastisol formulations. Availability: semicommercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

DINONYL PHTHALATE
(bis-2-propyl-4-methylpentyl phthalate)

$C_{26}H_{42}O_4$; M.W., 418.59; B.P. 152 C at 0.07 mm. Characteristics: color, 50 APHA, maximum; essentially odorless. Chemical properties: low-density plasticizer for PVC. Suggested uses: plasticizers in extrusion, calendered and plastisol PVC compounds. Availability: commercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

DISTILLED DINONYLPHENOL

M.W. 220; Sp. G. 0.90-0.92 at 25 C; Purity: predominately dinonylphenol. Characteristics: viscous, amber liquid. Solubility: soluble in organic solvents, such as benzene, white mineral oil, kerosene, and carbon tetrachloride; insoluble in water. Suggested uses: as an intermediate for surfactants, lube-oil additives, oil-soluble phenolic resins, plasticizers, antioxidants, corrosion inhibitors, disinfectants, and germicides; as an organic solvent. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

DIPHENYL CARBONATE

$CO(OC_6H_5)_2$; M.W., 214; M.P., 78-80 C; Purity, 99.1%; B.P., 302-306 C. Characteristics: white crystals. Solubility: insoluble in water; soluble in hexane, benzene, ethanol and carbon tetrachloride. Suggested uses: as a solvent; monomer; chemical intermediate. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

DIPROPYL AMINE

$(CH_3CH_2CH_2)_2NH$; M.W., 101.19; Sp. G., 0.7410 at 20/20 C; B.P. 110.7 C (760 mm.). Solubility: completely soluble in ethyl ether and methanol at 25 C. Suggested uses: as a secondary amine, of interest as an intermediate for rubber chemicals, emulsifiers, herbicides, pharmaceuticals, dyestuffs and textile finishing agents. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemical Co. Division.

DITERTIARYBUTYL SULFIDE

$C_4H_9SC_4H_9$; M.W., 144.4; Sp. G., 0.8273 at 20/4 C; M.P., —11.5 C; Purity, commercial grade; B.P., 147.3 C. Suggested uses: as a solvent; in organic syntheses. Availability: commercial quantities. Phillips Petroleum, Special Products Division.

1,1-DITOLYLETHANE

$(CH_3\text{-}C_6H_4)_2\ CH\text{-}CH_3$; M.W., 210.3; Sp. G., 0.976; M.P. —35 to —40 C; B.P., 176-181 C. Solubility: soluble in common organic solvents; insoluble in water. Chemical properties: undergoes reactions typical of arylalkanes. Suggested uses: as a solvent, plasticizer, and intermediate. Availability: experimental quantities. American Cyanamid Company, New Product Development Dept.

DI (TRIDECYL) AMINE

$(C_{13}H_{27})_2NH$; M.W., 381; Sp. G., 0.828 at 28/20 C; B. P., 175 C (0.3 mm.). Solubility: an oil-soluble, essential water-insoluble secondary amine. Suggested uses: as a metal extraction reagent that is particularly effective for the extraction of thorium from acid leach liquors. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co.

DIVINYL SULFONE

$CH_2{:}CHSO_2CH{:}CH_2$; M. W., 118.16; Sp. G., 1.1788 at 20/20 C; B. P., 234.4 C (760 mm.).

Solubility: in water, 11.5% by wt.; solubility of water in, 8.8% by wt. Chemical properties: will add to compounds with active hydrogens; will form long chain polymers with diols, di-amines, urea, and malonic esters; will copolymerize with acrylonitrile, styrene and acrylic esters. Suggested uses: in the preparation of addition polymers; modification of polyester resins; comonomer in synthetic fibers to improve dyeing characteristics; crosslinking of cottons and rayons to impart shrink-resistance. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Corp. Division.

DODECYLBENZENE SULFONIC ACID

$C_{18}H_{29}SO_3H$; Constituents: mixture of sulfonic acids of dodecylbenzene and sulfuric acid; M. W., 320 for active constituent; Sp. G., at 100 F, 1.091; Purity, 8% H_2SO_4 — 89% active, 2% H_2O, 1% 0.1. Characteristics: dark brown viscous liquid. Solubility: miscible in all proportions with water; gelatin occurs between 43 and 400 gms. H_2O per 100 gms. acid. Chemical properties: raw material detergent intermediate; can be used in "dry neutralization" techniques for producing finished detergent formulations. Suggested uses: in detergent applications of liquid or solid surfactants; as an emulsifier; as a solubilizing agent. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Chemicals Division.

DODECYL CARBAMATE

$C_{12}H_{25}OCONH_2$; M.W., 229; M.P., 82.5-83.3 C; Purity, 97.5%; Characteristics: white crystals. Solubility: insoluble in water and hexane; soluble in benzene, ethanol and carbon tetrachloride. Suggested uses: as a chemical intermediate; solvent possibilities. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

DODECYL CHLOROFORMATE

$C_{12}H_{25}OCOCl$; M. W., 248.5; Sp. G. 0.9486 (20/20); Purity, 96.8%; B. P., 130 C (5 min.); 99 C (1 min.). Characteristics: water-white liquid. Solubility: soluble in hexane, benzene, ethanol and carbon tetrachloride. Suggested uses: reactive intermediate, particularly in reactions with active hydrogen compounds. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

DODECYLPHENOL
(p-dodecylphenol)

M.W. 262. Characteristics: light-yellow liquid. Suggested uses: as an intermediate for surfactants, lube-oil additives, oil-soluble phenolic resins, plasticizers, antioxidants, corrosion inhibitors, disinfectants, and germicides; as an organic solvent. Availability: semicommercial quantities. General Aniline & Film Corp., Antara Chemicals, Sales Division.

DOW CORNING 22

Constituents: water-base emulsion; 40% silicone. Characteristics: white liquid. Solubility: easily dispersible in water. Chemical properties: applied to paper or similar materials, it cures quickly with application of heat to form an antiadhesive coating; treated paper will not stick to rubber polymers, adhesives, asphalt or most other sticky substances. Suggested uses: as a coating for wrapping and packaging papers. Availability: commercial quantities. Dow Corning Corp.

DOW CORNING 23

Constituents: silicone 30%; xylene 70%; Sp. G., 0.83-0.85. Characteristics: clear or light-straw liquid. Solubility: soluble in xylene or other aromatics, heptane, ethyl acetate, methyl ethyl ketone. Chemical properties: applied to paper or other materials, it cures quickly with application of heat to form an antiadhesive coating; treated paper will not stick to rubber polymers, asphalt, or most other sticky substances. Suggested uses: as a coating for wrapping and packaging papers. Availability: commercial quantities. Dow Corning Corp.

DOW CORNING R-7141

Constituents: silicone resin in toluene; Sp. G., 1.06. Characteristics: liquid, light-straw in color. Solubility: soluble in toluene and other aromatics. Suggested uses: R-7141 resin is used to laminate glass cloth; glass cloth so impregnated has excellent drape and handling properties, plus serviceability at temperatures above 500 F; used for fabricating complex parts having high strength at elevated temperatures, and low dielectric losses; specifically, for radomes, aircraft and duct work, and missile parts. Availability: commercial quantities. Dow Corning Corp.

DOW CORNING R-7501 and DOW CORNING R-7521

Constituents: solventless silicone resins; Sp. G., 1.13, 1.11. Characteristics: straw-colored liquids which can be reacted to form clear silicone plastics. Outstanding features: these solventless resins have outstanding resistance to temperatures as high as 500 F, good electrical properties, excellent water resistance, and high heat conductivity. Suggested uses: for potting, encapsulating, and impregnating electrical and electronic components. Availability: commercial quantities. Dow Corning Corp.

DOW CORNING Z-6018

Characteristics: transparent flake. Solubility: soluble in ketones, esters, chlorinated solvents, alcohols, aromatic solvents, and solvent blands having kauri-butanol values greater than 50. Chemical properties: this silicone intermediate will react with a wide variety of organic protective resins such as alkyds, phenolics, epoxies, cellulosics and polyesters, to improve their heat stability, moisture resistance, and weather resistance. Ability: semicommercial quantities. Dow Corning Corp.

DOW CORNING 808 RESIN

Constituents: silicone resin in xylene; 50% solids; Sp. G., 1.01. Characteristics: color: light straw; viscosity, 150 to 250 centipoises. Solubility: can be thinned with ketones, chlorinated solvents, glycol ethers, esters, butanol, and aromatic solvents. Chemical properties: cured coatings show little or no change in color and gloss at temperatures as high as 550 F, have good flexibility; has excellent adhesion and corrosion resistance. Suggested uses: suitable for use in formulating high-gloss baking enamels for use as decorative finishes. Availability: commercial quantities. Dow Corning Corp.

DOW CORNING 704 DIFFUSION PUMP FLUID

Constituents: silicone fluid. Sp. G., 1.07. Characteristics: colorless, clear liquid. Chemical properties: used to produce vacuums as low as 10^{-6} to 10^{-8} mm. of mercury, when used in suitable equipment; it is chemically inert, nontoxic and resistant to gamma radiation. Suggested uses: diffusion pump fluid for extremely high vacuums. Availability: semicommercial quantities. Dow Corning Corp.

DOWSOL® 12 and 17
(mono-1-(isobutyl)-3,5-dimethylhexyl dihydrogen phosphate)
(3,9-diethyl-6-tridecyl dihydrogen phosphate)

M. W., 266,336. Characteristics: sold as kerosene solution. Chemical properties: undergoes cation-exchange reactions with metals recovered; complexing action of phosphate group makes solvents quite selective. Suggested uses: extractants for recovery of uranium, vanadium, thorium and certain base metals in mining operations. Availability: Dowsol 17, semicommercial quantities; Dowsol 12, commercial quantities. Dow Chemical Co., Technical Service and Development Division.

DURENE (1, 2, 4, 5, - tetra methyl benzene)

M. W. 134.2; Sp. G. 0.838 (pure compound); M. P. 76.5-77 C minimum. Purity: 95% by weight; B. P. 196 C. Solubility: readily soluble in aromatic hydrocarbons, ether, and acetone; moderately soluble in alcohols, chlorinated aliphatic hydrocarbons or glacial acetic acid. Chemical properties: because of its high degree of reactivity, undergoes nitration, chlorination, sulfonation and chloromethylation almost as easily as phenol; either mono- or di substitution on the ring results in a single structure. Suggested uses: in curing Epon* resins in polyurethane rubber stacks, in resinous polyol preparation, and in making a large number of chemical intermediates. Availability: pilot-plant quantities. Shell Chemical Corp., Market Development Dept.

DUTCH BOY LECTRO 77
(lead chlorophthalosilicate)

Sp. G., 4.15; M. P., nonmelting; Purity, high. Characteristics: fine, white powder. Solubility: insoluble in water and all common organic solvents. Chemical properties: excellent combination of heat stability, electrical resistivity, water immersion resistance and ready dispersion with a wide range of plasticizers; low volume cost. Suggested uses: stabilizer for primary vinyl chloride electrical insulation. Availability: commercial quantities. National Lead Co.

DUTCH BOY LECTRO 78
(tetrabasic lead fumarate)

$4PbO{\cdot}PbC_2H_2(COO)_2{\cdot}2H_2O$; M. W., 1250; Sp. G., 6.54; M. P., nonmelting. Purity, high. Characteristics: fine, creamy-white powder. Solubility: insoluble in water and all common organic solvents. Chemical properties: exceptional heat stability, high electrical resistivity and moisture resistance; excellent light stability; good compatibility with vinyl plasticizers. Suggested uses: as a stabilizer for high-temperature vinyl chloride polymers and copolymers in electrical insulation, phonograph records, rigids, etc. Availability: commercial quantities. National Lead Co.

*Registered trademark.

DUTCH BOY TEMEX 3
(barium-zinc organic)

Sp. G., 1.15; Purity, high. Characteristics: fine, white powder. Chemical properties: outstanding heat stability; tile colors retained at initial shades; complete freedom from sulfide staining; very good light stability; adds no lubricity to stock. Suggested uses: as a stabilizer for vinyl chloride-asbestos filled flooring. Availability: commercial quantities. National Lead Co.

DYE CONCENTRATE

Sp. G., .928 at 75 F. Characteristics: fluid dye. Solubility: complete. Suggested uses: for coloring of gasoline, diesel fuels, fuel oils, lubricating oils, greases, automatic transmission fluids, break-in oils. Availability: commercial quantities. Patent Chemicals Inc.

DYTOL M-83
(octyl alcohol)

$CH_3(CH_2)_6CH_2OH$; Sp. G., 0.815-0.825; B. P., 193-196 C. Characteristics: a water-white liquid. Chemical properties: undergoes reactions typical of primary alcohols. Suggested uses: used as a chemical intermediate for oil additives, pharmaceuticals, rubber chemicals, plasticizers, cosmetics, leather chemicals, paper chemicals, and textile chemicals. Availability: commercial quantities. Rohm & Haas Co., Special Products Division.

DYTOL S-91
(decyl alcohol)

$CH_3(CH_2)_7CH_2OH$; Sp. G., 0.826; B. P., 229-233 C. Characteristics: water-white liquid. Chemical properties: undergoes reactions typical of primary alcohols. Suggested uses: as a chemical intermediate for oil additives, pharmaceuticals, rubber chemicals, plasticizers, cosmetics, leather chemicals, paper chemicals, and textile chemicals. Availability: commercial quantities. Rohm & Haas Co., Special Products Division.

EASTMAN 910 ADHESIVE
(methyl-2-cyanoacrylate)

Constituents: 90% methyl cyanoacrylate, 10% plasticizer, thickening agent and stabilizer; M. W., 111; B. P., 48-49 C at 2.6 mm. Characteristics: colorless liquid. Solubility: soluble in nitromethane and dimethylformamide. Chemical properties: a very reactive monomer which polymerizes to form strong bonds when pressed between two surfaces. Suggested uses: in various adhesive applications where a quick-setting, strong bond is desired without the need of catalyst, excessive pressure or heat cure. Availability: semicommercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

EASTMAN POLYMERIC PLASTICIZER NP-10
(neopentyl glycol, adipic acid polyester terminated with 2-ethylhexanol)

M. W., 1200-1300; Sp. G., 1.060; Characteristics: clear (100 APHA), viscous liquid. Solubility: soluble in aromatic, ketone and alcohol solvents; insoluble in aliphatic and inorganic solvents. Chemical properties: good hydrolysis and electrical stability; low extraction from PVC plastics; excellent weathering properties; low migration to polystyrene and nitrate lacquers. Suggested uses: refrigerator gasketing, electric cable insulations, vinyl tubing, etc. Availability: commercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

ECTEOLA

Constituents: reaction product of alkali cellulose, epichlorohydrin and triethanolamine. Characteristics: off-white powder. Solubility: insoluble in water. Chemical properties: ion exchanger. Suggested uses: for nucleic acid separation. Availability: semicommercial quantities. Brown Co., Research and Development Dept.

ELASTOPAR

Constituents: a blend of one-third n-methyl-n,4-dinitrosoaniline with two-thirds Whitetex Clay; M. W., 153; Sp. G., 1.452; M. P., min. 65 C; Purity, active 33±1%. Characteristics: beige powder, essentially odorless to slight amine odor. Solubility: soluble in hot isopropanol, dimethyl formamide; slightly soluble in benzene, toluene, petroleum ether. Chemical properties: a chemical modifier for butyl rubber, increases resilience 300% modulus, improves processability, lowers hysteresis and heat build-up. Suggested uses: as a vulcanization additive to butyl rubber. Availability: commercial quantities. Monsanto Chemical Co., Organic Chemicals Division.

EMERY 880-S FATTY ACID

Chemical properties: a monobasic fatty acid offering unusual economy. Suggested uses: as a raw material of the coconut fatty acid type in high-concentration liquid soaps. Availability: commercial quantities. Emery Industries, Inc., Fatty Acid Chemical Sales Dept.

NEW CHEMICALS FOR INDUSTRY

EMERY 3033-S LUBRICANT ESTER
(dipropylene glycol dipelargonate)

Characteristics: viscosity 2.6 centistokes at 200 F; at minus 65 F, 6500 centistokes; flash point 400 F. Solubility: soluble in all mineral oils. Chemical properties: an economical base for synthetic lubricants and greases; offers excellent performance at both low and high temperatures. Suggested uses: for synthetic lubricants and greases. Availability: commercial quantities. Emery Industries, Inc., Organic Chemical Sales Dept.

EMERY 3049-S POLYMERIC PLASTICIZER

Characteristics: a light-colored polymeric plasticizer with a viscosity at 25 C of 552,650 poises. Solubility: compatible with polyvinyl chloride. Chemical properties: provides maximum permanence to polyvinyl chloride and in addition provides easy processing on conventional equipment. Suggested uses: in all vinyl formulations especially where extreme permanence is required. Availability: commercial quantities. Emery Industries, Inc., Organic Chemical Sales Dept.

EMERY 3065-S POLYMERIZED FATTY ACID

Constituents: a mixture of approximately 75% C_{36} dibasic and 25% C_{54} tribasic acid. Sp. G. .947 at 15.5 C. Characteristics: a viscous liquid; acid value 186-194; neutralization equivalent 289-301. Solubility: insoluble in water, soluble in alcohol, ether, benzene and acetone. Chemical properties: a very unusual raw material for use where polybasic materials are needed; results in unique end products. Suggested uses: especially recommended for polyesters for urethane foams. Availability: commercial quantities. Emery Industries, Inc., Organic Sales Dept.

EMERY 3079-S POLYMERIZED FATTY ACID

Constituents: consist of 95% dibasic C_{36} acid and approximately 4% C_{54} tribasic acid. Characteristics: a viscous liquid; acid value 188-193; neutralization equivalent 292-298. Solubility: soluble in alcohol, ether, benzene, and acetone; insoluble in water. Chemical properties: a relatively pure dibasic acid of unusual characteristics; low cost may yield a very attractive raw material for the production of resins, polyesters, etc. Availability: commercial quantities. Emery Industries, Inc., Organic Chemical Sales Dept.

EMERY 3162-S POLYMERIZED FATTY ACID

Constituents: approximately 91% C_{54} tribasic acid and 5% C_{36} dibasic acid. Characteristics: a viscous liquid, acid value 183-188; neutralization equivalent 299-306. Solubility: partially soluble in mineral spirits, soluble in alcohol, and ethers; insoluble in water. Chemical properties: a very unusual raw material that is readily available from domestic sources; an economical source for tribasic materials. Suggested uses: as a raw material for all types of polymeric materials, including epoxy resins. Availability: commercial quantities. Emery Industries, Inc., Organic Chemical Sales Dept.

EPOLENE C

Constituents: low molecular weight polyethylene. Sp. G., 0.907; M. P., 101-102 C. Characteristics: colorless, odorless pellets. Solubility: soluble in hot aliphatic and aromatic hydrocarbons; insoluble in all cold solvents. Chemical properties: a type of polyethylene having many of the properties of plastic grades, yet capable of being used as a hot melt. Suggested uses: for paper coatings, food packaging, wax blending, adhesives and slush molding. Availability: semicommercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

3,4-EPOXYCYCLOHEXANE CARBONITRILE

C_7H_9ON; M. W., 123.17; Sp. G., 1.0929 at 20/20 C; B. P., 244.5 C (760 mm.) and 151 C (50 mm.). Solubility: in water, 4.69% by weight at 20 C; solubility of water in, 1.28% by weight at 20 C. Chemical properties: epoxy group undergoes typical reactions; cyanide group can be hydrolyzed to introduce the carboxyl structure or reduced to the corresponding amine. Suggested uses: as a chemical intermediate. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

2,3,-EPOXY-2-ETHYLHEXANOL

$C_8H_{16}O_2$; M. W., 144.22; Sp. G., 0.9517 at 20/20 C; B. P., 131 C (at 50 mm.); 96 C (at 10 mm.). Solubility: in water, 0.82% by weight at 20 C; solubility of water in, 10.5% by weight at 20 C. Chemical properties: epoxy ring can be opened by usual reactions; hydrolysis yields the triol derivative; hydroxyl groups can be esterified. Suggested uses: as an intermediate for plasticizers and resins. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

3,4-EPOXY-6-METHYLCYCLOHEXYLMETHYL ACETATE

$C_{10}H_{16}O_3$; M. W., 184.24; Sp. G., 1.0720 at 20/20 C; B. P., 259 C (at 760 mm.); 166 C (50 mm.). Solubility: in water, 0.71% by weight at 20 C; solubility of water in, 2.42% by weight at 20 C. Chemical properties. epoxy ring can be opened to produce the cyclic glycol. Suggested uses: as a chemical intermediate; acid acceptor. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

ESTYNOX *308

Constituents: fully epoxidized acetylated castor oil. M.W. 1080; Sp. G. 1.015 at 25 C. Characteristics: light-colored, low viscosity liquid with O F pour point. Solubility: soluble in alcohols, esters, ketones and aromatic hydrocarbons; insoluble in water; partly soluble in aliphatic hydrocarbons. Chemical properties: a polymeric (tri-glyceride) plasticizer containing both acetoxy and epoxy groups; has alcohol solubility, stability to heat & light, and resistance to oils & gasoline. Suggested uses: as a stabilizer-plasticizer for polyvinyl chloride, nitrocellulose, ethyl cellulose, cellulose acetate butyrate and rubber. Availability: commercial quantities. The Baker Castor Oil Co.

ETHYLALUMINUM SESQUICHLORIDE

$(C_2H_5)_3$ Al_2 Cl_3; Constituents: a 50:50 mixture of diethylaluminum chloride and ethylaluminum dichloride; Purity, ethylaluminum sesquichlorides—95% min., chloride —40% min. Characteristics: form: liquid; color; straw to clear. Chemical properties: spontaneously flammable in air, reacts violently with water; reacts with NaH to give corresponding hydrides. Suggested uses: polymerization catalyst; chemical intermediate. Availability: semicommercial quantities. National Distillers and Chemical Corp., U. S. Industrial Chemicals Co. Division.

ETHYL 4-FORMYLBUTYRATE

$CHO(CH_2)_3COOC_2H_5$; M. W., 144.17; Sp. G., 1.0313 at 20/20 C; B. P., 207 C (at 760 mm.). Solubility: in water, less than 0.01% by weight; solubility of water in, 5.0% by weight. Suggested uses: as a chemical intermediate. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

ETHYL 3-FORMYLPROPIONATE

$CHO(CH_2)_2COOC_2H_5$; M. W., 131.15; Sp. G., 1.0625 at 20/20 C; B. P., 190.9 C (760 mm.). Solubility: in water, 1.57% by weight at 20 C; solubility of water in, 36.5% by weight at 20 C. Suggested uses: as a chemical intermediate. Availability: experimental quantities. Union Carbide Chemicals Co. Division.

2-ETHYLHEXYL CARBAMATE

$C_4H_9CH(C_2H_5)CH_2OCONH_2$; M. W., 173; M. P., 39-40 C; Purity, 99.5%. Characteristics: white crystals. Solubility: insoluble in water; soluble in hexane, benzene, ethanol and carbon tetrachloride. Suggested uses: as a chemical intermediate; solvent possibilities. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

2-ETHYLHEXYL CHLOROFORMATE

$C_4H_9CH(C_2H_5)CH_2OCOCl$; M. W., 192.5; Sp. G., 0.9889 (20/20 C); Purity, 99.5%; B. P., 735 C (100 mm.), 100 C (25 mm.). Characteristics: water-white liquid. Solubility: soluble in benzene, hexane, ethanol and carbon tetrachloride. Suggested uses: as a reactive intermediate, particularly in reactions with active hydrogen compounds. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

ETHYLIDENE CHLORIDE

CH_3CHCl_2; M. W., 98.97; Sp. G., 1.17-1.18; Purity, 98-99%; B. P., 55-57 C. Characteristics: colorless liquid of typical odor. Solubility: insoluble in water, miscible with most organic solvents. Suggested uses: useful as a solvent and as a source of nascent acetaldehyde. Availability: experimental quantities. Eastern Chemical Corp., Development Dept.

2-ETHYL ISOHEXANOIC ACID
(2-ethyl-4-methyl-pentanoic acid)

M. W., 144; Sp. G., 0.9036 at 20/20 C. Characteristics: colorless liquid. Solubility: .3 g./100 g. H_2O at 25 C. Suggested uses: in paint drier and vinyl stabilizer fields; can also be readily reacted with primary alcohols for use in the plasticizer field. Availability: semicommercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

ETHYL 3-OXATRICYCLO [3.2.1.0^{2,4}]-OCTANE-6-CARBOXYLATE

$C_{10}H_{14}O_3$; M. W., 182.22; Sp. G., 1.1363 at 20/20C; B. P., 255.8C (at 760 mm.); 162C (at 50 mm.). Solubility: in water, 0.74% by weight at 20C; solubility of water in, 1.23% by weight at 20C. Chemical properties: undergoes typical epoxy reactions. Suggested uses: as a chemical intermediate; acid acceptor. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

ETHYLSULFONYLETHANOL
(2-ethylsulfonylethanol)

$CH_3CH_2SO_2CH_2CH_2OH$; M. W., 138.19; Sp. G., 1.252-1.258g./ml; Set Point, 38.0-40.5C; Purity, 98.0% min.; B. P., 155-156. Characteristics: colorless crystalline solid (subject to supercooling). Solubility: very soluble in water, ethanol, butanol, acetone, methyl ethyl ketone, ethyl acetate, as well as nitro benzene. Chemical properties: exceptionally low toxicity and lack of skin irritancy; miscibility with water and a wide variety of polar organics. Suggested uses: solubilizer, humectant and antistatic agent in cosmetic and pharmaceutical preparations; removable antistatic agent for acrylic and vinylic films, fibers and fabrics; plasticizer intermediate. Availability: experimental quantities. Pennsalt Chemical Corp., Technical Commercial Development Dept.

FERRO 1212A

Constituents: a barium-cadmium-organic inhibitor mixture. Characteristics: clear, light-tan colored, mobile liquid. Solubility: soluble in most vinyl plasticizers and easily dispersible in all vinyl formulations. Chemical properties: designed as an all purpose stabilizer for calendering, extrusion and plastisol resins; outstanding features, when compounded in vinyls, 1) exceptional clarity; 2) exceptional whiteness and early color retention; 3) low lubricity and plateout on calender rolls, 4) exceptional light stability. Suggested uses: as a heat and light stabilizer for nearly all types of vinyl formulations; recommended dosage: from two to three parts. Availability: commercial quantities. Ferro Chemical Corp.

FERRO 1981

Characteristics: white odorless powder. Solubility: dispersible in banburied or calendered vinyl mixes. Chemical properties: designed especially for the heat and light stabilization of high carbonate filled asbestos floor tile; it has several outstanding features: 1) prevents the brown discoloration associated with the heat of asbestos-filled vinyls; 2) metal-free and therefore, does not cause sulfur-staining; 3) it is nonlubricating. Suggested uses: recommended for use as a heat stabilizer for high calcium-carbonate filled asbestos vinyl floor tile; recommended dosage: one part per hundred parts of asbestos tile mix (about four parts per hundred parts of resin). Availability: commercial quantities. Ferro Chemical Corp.

FERRO 1982

Characteristics: white odorless powder. Solubility: dispersible in banburied or calendered vinyl mixes. Chemical properties: designed especially for the heat and light stabilization of low calcium-carbonate filled asbestos floor tile; it has several outstanding features: 1) prevents the brown discoloration associated with the heat of asbestos filled vinyls; 2) metal-free and therefore, does not cause sulfur staining; 3) nonlubricating. Suggested uses: recommended for use as a heat stabilizer for low calcium-carbonate filled asbestos vinyl floor tile; recommended dosage: one part per hundred parts of asbestos tile mix (about four parts per hundred parts of resin). Availability: commercial quantities. Ferro Chemical Corp.

FERRO 2020

Constituents: barium-cadmium soap complex. Characteristics: white to light cream-colored powder of very low odor. Solubility: moderate

*Registered trademark.

solubility in vinyl plasticizers at elevated temperatures. Chemical properties: has three outstanding features when used in pigmented and/or filled vinyl stocks: 1) very little, if any, pigment or filled buildup on the calender or embossing rolls; 2) heat stability in a filled system is much improved over regular barium-cadmium soaps; 3) sulfur staining is at a minimum. Suggested uses: recommended for use as a heat and light stabilizer for pigmented and/or filled calendered and extruded vinyls; dosage recommended: one to two parts per hundred parts of resin. Availability: commercial quantities. Ferro Chemical Corp.

FLAVIN ADENINE DINUCLEOTIDE

$C_{27}H_{33}O_{15}P_2$; M.W. 785.6; Purity: 90%+. Characteristics: bright orange powder. Solubility: easily soluble in water, phenol, pyridine; less soluble in ether, chloroform, acetone and alcohol. Chemical properties: strongly hygroscopic; a yellow aqueous solution that fluoresces under ultraviolet light. Suggested uses: in biochemical and nutritional research. Availability: commercial quantities. Schwarz Laboratories, Inc.

FLEXRICIN °32

Constituents: tri-glyceride derivative of castor oil; largely di-hydroxy in structure. M.W. 910; Sp. G. 0.948 at 25 C. Characteristics: unsaturated liquid. Chemical properties: iodine value 103; hydroxyl value 100; its di-hydroxy structure leads to more linear urethane polymers having greater flexibility and resiliency. Suggested uses: modification of urethane polymers. Availability: semicommercial quantities. The Baker Castor Oil Co.

FLEXRICIN °83

Constituents: tri-glyceride derivative of castor oil, largely di-hydroxy in structure. M. W., 950; Sp. G., 0.962 at 25 C. Characteristics: unsaturated liquid. Chemical properties: iodine value 82; hydroxyl value 105; a di-functional castor oil; it's di-hydroxy structure leads to more linear urethane polymers of greater flexibility and resiliency. Suggested uses: in the modification of urethane polymers; as an additive in one-step polyester and polyether foams for lowering compression set and producing softer foams. Availability: semicommercial quantities. The Baker Castor Oil Co.

FLEXBOND 100
(vinyl acetate-stearate copolymer emulsion)

Constituents: 55% solids emulsion. Characteristics: white stable emulsion: particle size 0.5 microns; pH 5.0-6.0. Chemical properties: films cast are nontoxic; greaseproof; internally plasticized; heat-sealable. Suggested uses: in paper and film coatings; paints; adhesives. Availability: semicommercial quantities. Air Reduction Co., Inc., Colton Chemical Co. Division.

FLEXBOND BEADS No. 1085-13
(vinyl acetate-stearate copolymer beads)

Characteristics: white beads. Solubility: soluble in benzene, toluene, methanol, methyl acetate, carbon tetrachloride. Chemical properties: films cast from beads are nontoxic, internally plasticized, greaseproof, and heatsealable. Availability: experimental quantities. Air Reduction Co.

FLEXBOND 306 EMULSION
(vinyl acetate-acrylic terpolymer)

Constituents: 55% solids. Sp. G. 1.09; Characteristics: white, stable emulsion; mean particle size 0.3 microns; pH 4.5-6. Chemical properties: at high pigment-volume concentrations, paints exhibit the color uniformity, stain removal characteristic of straight acrylic emulsions. Suggested uses: paints and paper coatings. Availability: commercial quantities. Air Reduction Co., Inc., Colton Chemical Co.

FLUDEX

Constituents: A water-soluble surfactant utilizing chemical characteristics of bactericides, scale inhibitors, corrosion inhibitors, and wetting agents. Characteristics: liquid; dark amber. Solubility: soluble in water and brine. Chemical properties: corrosion preventative, bactericide; scale preventative; surface-active agent. Suggested uses: in water systems—to prevent corrosion, scale and primarily to decrease input pressures and increase water input in waterflood oil-field operations. Availability: commercial quantities. Petrolite Corp., Tretolite Co. Division.

FLUSHED LIGHTFAST BENZIDINE YELLOW

Constituents: benzidine yellow pigment in #3 pale litho varnish. Characteristics: paste. Solubility: compatible in alkyd and linseed varnishes. Chemical properties: has over 72 hours light-fastness (Fadeometer). Suggested uses: to prepare printing ink greens by combining with phthalocyanine blue pigment; such inks will have light-fastness of tungstated yellows at a lower cost. Availability: commercial quantities. Sterling Drug Inc., Hilton-Davis Chemical Co. Division.

FOAMWILT

Constituents: petroleum fractions, surface-active agents. Sp. G. 0.85. Characteristics: yellow liquid, mild odor. Solubility: insoluble in water. Chemical properties: foam destroying in aqueous media. Suggested uses: as a defoamant in sewage disposal plants using the activated sludge principle. Availability: commercial quantities. Fine Organics Inc.

FOLEX
(tributyl phosphorotrithioite)

$(C_4H_9S)_3P$; Constituents: marketed as a 72% emulsifiable concentrate. M. W., 298; M. P., liquid at ordinary temperatures; Purity 97%; B. P. 115-134 C (0.08 mm.). Characteristics: emulsifiable concentrate; amber liquid; slight mercaptan odor. Solubility: readily emulsifies with water. Chemical properties: noncorrosive, effective defoliant at low concentrations; drops leaves while still green; not affected by rain. Suggested uses: defoliation of cotton, roses, hydrangeas, food crops, and woody species. Availability: commercial quantities. Virginia-Carolina Chemical Corp., Chemicals Division.

FORTIFLEX A-20
(polyethylene [high density])

M. W. very high; Sp. G., .96; M. P. softens at 260 F; Purity, 99.8+%. Characteristics: translucent, pearly white molding granules. Chemical properties: toughness and resistance to environmental stress cracking. Suggested uses: for extruded pipe and blow molding; extruded sheet. Availability: commercial quantities. Celanese Corp. of America, Plastics Division.

FORTIFLEX A-500
(polyethylene [high density])

M. W., fairly low; Sp. G., .96; M. P. softens at 260 F; Purity: 99.8+%. Characteristics: translucent, pearly white molding granules. Chemical properties: easy moldability, especially for large sections or parts of thin walled sections; excellent molded finish. Suggested uses: for general household items up to and including waste-basket size; practically all toy applications; disposable packages. Availability: commercial quantities. Celanese Corp. of America, Plastics Division.

FREON° MF SOLVENT
(trichloromonofluoromethane)

CCl_3F; M. W., 137.4; Density at 70F, 1.485 gm/cc.; M. P., —111.0C; Purity, 99%+; B. P. 23.8C. Characteristics: practically odorless, water-white liquid. Solubility: offers good solubility for oils, greases, hydrocarbons; comparatively inert to plastic and elastomeric materials. Chemical properties: extremely stable; requires no inhibitors: relatively nontoxic; nonflammable. Suggested uses: for cleaning hermetic-motor compressors: flash-point elevator in blends: cleaner for oxygen storage tanks and equipment brine. Availability: commercial quantities. E. I. du Pont de Nemours & Co., Inc., Freon Products Division.

FREON° TF SOLVENT
(trichlorotrifluoroethane)

$CCl_2F\text{-}CClF_2$; M. W., 187.4; Density at 70F, 1.574 gm/cc.; M. P. —35C; Purity, 99%+; B. P., 47.6C. Characteristics: practically odorless, water-white liquid. Solubility: offers good solubility for oils, greases, hydrocarbons; comparatively inert to plastic and elastomeric materials. Chemical properties: extremely stable; requires no inhibitors; relatively nontoxic; nonflammable. Suggested uses: as a vapor degreasing solvent; large motor and generator cleaner; photographic film cleaner; cleaner for electronic instruments and precision instruments; cleaning hermetic motor stators. Availability: commercial quantities. E. I. du Pont de Nemours & Co., Freon Products Division.

GEN-FLO 62
(styrene-butadiene emulsion)

Constituents: 60% styrene, 40% butadiene. Sp. G. 1.01. Characteristics: low-odor, white liquid. Chemical properties: clear films show superior resistance to water in conjunction with greater adhesion. Suggested uses: for paper coatings, textile printing inks, textile coatings, interior paints. Availability: commercial quantities. General Tire & Rubber Co., Chemical Division.

GENTHANE S
(polyurethane elastomer)

Characteristics: gum form. Chemical properties: good oil resistance; extremely good ozone resistance; good low and high-temperature properties; can be processed with standard rubber equipment. Suggested uses: for "o" rings; shoes and boots; soling and heels; specialty products. Availability: semicommercial quantities. General Tire & Rubber Co. Chemical Division.

L-GLUTAMIC ACID DECARBOXYLASE ENZYME

Chemical properties: specifically catalyzes the decarboxylation of L-glutamic acid to γ-aminobutyric acid and carbon dioxide. Suggested uses: in the quantitative determination of L-glutamic acid in foods, pharmaceuticals and protein hydrolysates. Availability: laboratory quantities. International Minerals and Chemical Corp., Industrial Minerals Division.

L-GLUTAMINE

$C_5H_{10}O_3N_2$; M. W. 146.1; M. P. 184-187 C; Purity: chromatographically homogeneous. Characteristics: white, crystalline powder; free-flowing. Solubility: at 25 C about 3.5 g./100 ml. H_2O. Suggested uses: as a substrate for microbiological activity; for feeding experimentations with amino acids; for clinical investigations in treatment of alcoholics, ammonium toxicity, hepatic conditions, mental deficiencies, peptic ulcers, epilepsy. Availability: commercial quantities. Schwarz Laboratories, Inc.

GLYCOLIC ACID
(hydroxyacetic acid)

$HO.CH_2.CO_2H$; M. W., 76.05; M. P., 77-79C; Purity 99%. Characteristics: white needles. Solubility: soluble in water, alcohol and ether. Chemical properties: hygroscopic; forms an intermolecular lactone. Suggested uses: as an intermediate. Availability: semicommercial quantities. Matheson Company, Inc., Matheson Coleman & Bell Division.

GLYCOLIC ACID, SODIUM SALT
(hydroxyacetic acid, sodium salt)

$HO.CH_2CO_2Na$; M. W., 97.95; Purity, 98%. Solubility: soluble in water and alcohol. Chemical properties: hygroscopic. Suggested uses: as an intermediate. Availability: semicommercial quantities. The Matheson Company, Inc., Matheson Coleman & Bell Division.

GLYCOL MONOSALICYLATE

$C_6H_4(OH)COOCH_2C_2OH$; M. W., 182.17; Sp. G., approximately 1.251 at 25C; M. P., crystallizing pt. 24C; Purity, essentially pure; B. P. 147C. at 4 mm. Characteristics: colorless oily liquid or white crystalline solid. Solubility: insoluble in water; very soluble in alcohol, benzene, chloroform, ether. Chemical properties: odorless, low volatility; topical analgesic; strong uv. absorber. Suggested uses: as an ingredient in pharmaceutical rubbing preparations, salves, liniments, sunscreen lotions. Availability: commercial quantities. Monsanto Chemical Co., Organic Division.

GLYCOMUL
(alkylolamid of fatty acid)

Characteristics: tan powder. Chemical properties: softener and lubricant. Suggested uses: for imparting softness to hair and in cosmetic preparations. Availability: commercial quantities. Glyco Products Co., Inc.

GLYCOSPERSE

Sp. G., 1.04 at 25C. Characteristics: yellow liquid; bland odor. Solubility: dispersible in water. Chemical properties: iodine value, less than 8; pH (5%) 6-8; 100% active nonionic liquid emulsifying agent. Suggested uses: for latex paints; prevents flooding; defoamer; leveller; aid to pigment grinding; disperses phenyl mercurial-type fungicides; emulsifier for resin additives and plasticizers. Availability: commercial quantities. Glyco Products Co., Inc.

GRAHAM'S SALT

$(NaPO_3)n$ M. W., 9,200-5,500; Sp. G., true 2.44, powder 85-72 lbs./cu.ft.; M. P., 450-500C. to flow; Purity, food grade; B. P., decomp. > 1400C. Characteristics: clear glass plates or ground white powder. Solubility: infinite in water. Chemical properties: forms complexes with metal ions; dispersant (deflocculant); interacts with proteins in several different ways as precipitation, peptization (emulsions) and viscosity alterant. Suggested uses: dispersant, sequestrant, blocking crystal growth, protein interaction. Availability: semicommercial quantities. Monsanto Chemical Co., Inorganic Chemicals Division.

HELLMERCO BLUE 4 GL

Characteristics: finely ground, dense blue powder prepared for dispersing in aqueous process; nondusting, free-flowing with no objectionable odor and with good storage stability; this dispersible pigment is a green shade of blue which has excellent wetting out and dispersion characteristics; satisfactory addition may be made directly to aqueous processes or added as previously prepared stock dispersions. It is compatible with the normal paper-making chemicals such as pulp water, clay, starch, silicate, rosin, salt, aluminum melamine wet-strength resin. Suggested uses: in coloring paper by beater on coating procedure where a green shade of blue of good light-fastness is

NEW CHEMICALS FOR INDUSTRY 48

desired; where good alkali fastness is required such as board cover, writing, white patent coated and bleached manila board, ground wood papers, bristols, book, coated paper and coated board, wrapping box covers, and specialty papers; an excellent base for medium blue whites that are to be brightened by optical bleaches. Availability: commercial quantities. American Cyanamid Co., Organic Chemicals Division.

HI-FAX
(high-density polyethylene)

CH_3-$(CH_2$-$CH_2)_n$-CH_3; Constituents: not a mixture or formulation. M. W. 115,000 to 570,000; Sp. G., 0.945; M. P., 131 C (crystalline); Purity: 99.9+%. Characteristics: odorless, colorless translucent, molding powder granules. Solubility: insoluble. Chemical properties: high tensile strength; resistant to temperatures above 100 C and below —100 C; low permeability to gases and vapors; boilable and sterilizable; resistant to stress-cracking; abrasion-resistant; more rigid than low density; good resistance to organic solvents and chemical reagents. Suggested uses: for blown bottles, film, housewares, industrial molding and extrusions, monofilaments, paper coatings, pipe and tubing, sheet, sporting goods, toys, vacuum-forming, wire and cable. Availability: commercial quantities. Hercules Powder Co., Cellulose Products Dept.

HIGH DENSITY A-C POLYETHYLENE

M. W., greater than 750,000; Sp. G .96; M. P., 125 C. Characteristics: colorless pellets. Suggested uses: for injection molding, compression molding and film extrusion, jars, tubes, bottles, wire coatings, monofilaments and sheets. Availability: semicommercial quantities. Allied Chemical & Dye Corp., Semet-Solvay Petrochemical Division.

HIGH DENSITY A-C POLYETHYLENE PIPE COMPOUND

Constituents: low pressure A-C polyethylene, carbon black, antioxidant. M. W., greater than 750,000; Sp. G. .96; M. P. 125 C. Characteristics: black pellets. Chemical properties: can be extruded into flexible pipe. Suggested uses: for polyethylene pipe extrusion. Availability: commercial quantities. Allied Chemical & Dye Corp., Semet-Solvay Petrochemical Division.

HILTAZENE* FAST COLOR BASES

Constituents: fast color base solutions. Characteristics: solvent-water solutions. Solubility: water dispersible. Chemical properties: clean, easy-to-handle solutions that provide rapid diazo formation of fast color bases; when coupled to suitable developer compounds, give bright, clean colors. Suggested uses: for dyeing on cotton. Availability: commercial quantities. Sterling Drug Inc., Hilton-Davis Chemical Co. Division.

HISET*

M. P. 220-230 C. Characteristics: hard, gray-colored wax. Solubility: insoluble in water and alcohol; soluble hot in naphtha and mineral oil; gels on cooling. Chemical properties: highest melting point synthetic wax commercially available; high flash point (590 F) minimizes fire and explosion hazards. Suggested uses: coatings for wood, paper, textiles, metals and plastics; compositions for carbon paper, inks, crayons, waterproofing, lubricant, insulation, polishes, rubber compounding, solvent resistant packing and antiblocking. Availability: commercial quantities. Glyco Products Co., Inc.

HYAMINE 2744
(octyl phenoxy ethoxy ethyl dimethyl p-chlorobenzyl ammonium chloride)

M. W. 482; M. P. 120 C; Purity, 97%. Characteristics: virtually odorless white crystals. Solubility: freely soluble in water and lower alcohols. Chemical properties: high activity cationic germicide. Suggested uses: in the preparation of solid germicides and deodorants. Availability: commercial quantities. Rohm & Haas Co., A&SC Dept.

HYAMINE 3500 (50%)
(n-alkyl [C_{14}, C_{12}, C_{16}] dimethyl benzyl ammonium chlorides)

M. W. 358; Sp. G. 0.97; Purity: 50%. Solubility: freely soluble in water. Chemical properties: high activity cationic germicide. Suggested uses: in the preparation of liquid and powdered sanitizers and detergent-sanitizers. Availability: commercial quantities: Rohm & Haas Co., A&SC Dept.

HYDROGENATED BISPHENOL A (TECHNICAL) 2,2'-bis(4-cyclohexanol)propane

$C_{15}H_{28}O_2$; M.W., 240.35; Purity, approximately 90%. Characteristics: off-white solid. Solubility: soluble in ethanol. Chemical properties: saturated alicyclic high-molecular-weight diol which imparts unusual properties to polyester resins. Suggested uses: as an intermediate for polyesters, plasticizers adhesives, surface-active agents, pharmaceuticals and agriculture chemicals. Availability: semicommercial quantities. Monsanto Chemical Co., Organic Division.

BIS(2-ETHYLHEXYL) HYDROGEN PHOSPHATE

Sp. G., 0.972; Purity, 95%: Characteristics: pale yellow mobile liquid. Solubility: insoluble in water; soluble in ethanol, acetone, benzene, toluene, hexane, kerosene. Chemical properties: strong monohydrogen acid; forms complexes with uranium and other rare metals, and salts with alkalis and amines. Suggested uses: liquid-liquid metal extraction; corrosion inhibitor; acid catalyst. Availability: commercial quantities. Virginia-Carolina Chemical Corp., Chemicals Division.

N-HYDROXYETHYL PIPERAZINE

$HOCH_2CH_2NCH_2CH_2NHCH_2CH_2$; M. W., 130.19; Sp. G., 1.0614 at 20/20C; B. P., 246.3C (at 760 mm.). Characteristics: a light colored liquid with a typical amine odor. Solubility: complete in water; solubility of water in, complete. Chemical properties: combines three different reactive groups (secondary amine, tertiary amine and hydroxyl) in a low molecular weight; reacts with fatty acids to give surface active products capable of being modified at the nitrogen group; dehydration yields n-vinyl piperazine. Suggested uses: in manufacture of tranquilizing drugs, antihistamines, anthelmintics, dyestuffs, detergents, rubber chemicals and monomers. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co.

HYPROSE* SP80
(octakis[2-hydroxypropyl]sucrose)

Sp. G., 1.160-1.180 at 70/20C. Characteristics: viscous, yellowish-amber liquid. Chemical properties: multiple reactive hydroxyls; high viscosity; low volatility compared to other polyols. Suggested uses: as a polyurethane cross-linking agent; plasticizer for cellulosic materials. Availability: semicommercial quantities. Dow Chemical Co., Technical Service and Development Division.

HYPSIN* GP25 (hydroxypropylglycerine)

Sp. G. 1.07-1.10 at 25/25C. Characteristics: viscous, yellowish-amber liquid. Solubility: soluble in water, methanol, ethanol, acetone, benzene; insoluble in carbon tetrachloride, n-heptane. Chemical properties: low volatility compared to other polyols. Suggested uses: plasticizer for cellulosic materials; alkyd resin, polyester raw material. Availability: semicommercial quantities. Dow Chemical Co., Technical Service and Development Division.

IGEPAL CO-990
(nonylphenoxy polyoxyethylene ethanol)

Purity: 99+%. Characteristics: waxy solid. Solubility: soluble in water. Chemical properties: highly water-soluble nonionic; stable to high concentrations of electrolytes and to high temperatures. Suggested uses: in dispersing alkali-soluble resins used in floor-wax formulations; in emulsion polymerization; in latex stabilization. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

IGEPAL DM-430
(higher alkylphenoxy polyoxyethylene ethanol)

Purity: 99+%. Characteristics: liquid. Solubility: soluble in non-polar solvents. Chemical properties: emulsifier, stabilizer, solubilizer, detergent. Suggested uses: as an emulsifier of agricultural chemicals and nonpolar solvents; in emulsion aerosols and in emulsion polymerization; of interest in household detergent formulations and in the textile industry as a detergent and antistatic finish. Availability: semicommercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

IGEPAL DM-730
(higher alkylphenoxy polyoxyethylene ethanol)

Purity: 99+%. Characteristics: light-colored wax. Solubility: soluble in water. Chemical properties: highly water-soluble nonionic; stable to storage at high temperatures, hard water, ionic surfactants, acids, and alkalies. Suggested uses: as a surfactant in high concentrations of electrolytes, emulsion polymerization, latex stabilization. Availability: semicommercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

IGEPAL DM-880
(higher alkyl phenoxy polyoxyethylene ethanol)

Sp. G., 1.06 at 50 C; Purity: 99.5% minimum. Characteristics: waxy solid. Solubility: soluble in water, aromatic solvents, methanol, ethanol; insoluble in perchloroethylene, butyl acetate, ethylene glycol (forms emulsion). Chemical properties: highly water-soluble nonionic; stable to storage at high temperatures, hard water, ionic surfactants, acids, and alkalies. Suggested uses: as an emulsifier for fatty acids and aromatic solvents; in emulsion polymerization, latex stabilization, and in formulating high-temperature acid cleaners. Availability: semicommercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

IGEPAL RC-520
(higher alkyl phenoxy polyoxyethylene ethanol)

Sp. G., 1.03 at 25 C; Purity: 99.5% minimum. Characteristics: clear liquid. Solubility: soluble in nonpolar hydrocarbon solvents, polar solvents such as perchloroethylene, trichloroethylene, pine oil, ethyl alcohol, methyl alcohol. Chemical properties: oil-soluble nonionic having unusual and superior emulsifying properties; stable to storage at high temperatures, hard water, ionic surfactants, acids, and alkalis. Suggested uses: for aerosol emulsions, agricultural and insecticidal emulsions, cosmetic emulsions, drycleaning "soaps", emulsion polymerization, etc. Availability: semicommercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

IGEPAL RC-630
(higher alkyl phenoxy polyoxyethylene ethanol)

Sp. G., 1.05 at 25 C; Purity: 99.5% minimum. Characteristics: clear liquid. Solubility: soluble in water, aromatic solvents, perchloroethylene, ethanol, methanol; partially soluble in ethylene glycol. Chemical properties: nonionic having good wetting, detergent, emulsifying, and dispersing properties; stable to storage at high temperatures, hard water, ionic surfactants, acids and alkalis. Suggested uses: for acid cleaning; as an agricultural emulsifier and wetter; for antidusting; in detergent-sanitizers. Availability: semicommercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

IGEPAL RC-760
(higher alkyl phenoxy polyoxyethylene ethanol)

Sp. G., 1.04 at 50 C; Purity: 99.5% minimum. Characteristics: soft wax. Solubility: soluble in water, aromatic solvents, ethylene glycol, ethanol, methanol; partially soluble in perchloroethylene; insoluble in aliphatic solvents. Chemical properties: highly water-soluble nonionic surfactant having good detergent and wetting properties; stable to storage at high temperatures, hard water, ionic surfactants, acids, and alkalis. Suggested uses: in acid cleaning; as an aromatic oil emulsifier; in household detergents, industrial cleaners. Availability: semicommercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

IGEPAL RC-890
(higher alkyl phenoxy polyoxyethylene ethanol)

Sp. G., 1.06 at 50 C; Purity: 99.5% minimum. Characteristics: waxy solid. Solubility: soluble in water, aromatic solvents, butyl acetate, ethanol, methanol; partially soluble in perchloroethylene; insoluble in ethylene glycol (forms emulsions), aliphatic solvents. Chemical properties: highly water-soluble nonionic surfactant; stable to storage at high temperatures, hard water, ionic surfactants, acids, and alkalis. Suggested uses: as an emulsifier for fatty acids

*Registered trademark.

and aromatic solvents; in emulsion polymerization; for latex stabilization; high-temperature acid cleaners. Availability: semicommercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

IMINO-bis-PROPYL AMINE

$HN\text{-}(CH_2CH_2CH_2NH_2)_2$; M. W., 131.22; Sp. G., .9307 at 20/20C; B. P., 232C (760 mm.) and 113C (10 mm.) Characteristics: a water-white liquid. Solubility: completely soluble in water and common polar organic solvents. Chemical properties: undergoes reactions typical of secondary amines. Suggested uses: as an intermediate in the preparation of textile and paper treating resins, dyestuffs, insecticides, rubber chemicals, pharmaceuticals, ion exchange resins and surface active agents. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co.

INOSINATE, CRYSTALLINE SODIUM
(sodium inosine 5'-phosphate)

$C_{10}H_{12}O_8N_4$ (free acid); M. W., 316.2 (free acid); Purity: chromatographically homogeneous. Characteristics: white, crystalline powder. Solubility: soluble in water giving a colorless solution; may contain various waters of crystallization. Suggested uses: for biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

ISATOIC ANHYDRIDE
(4H-3,1-benzoxazine 2,4 [1H]-dione)

$C_8H_5O_3$; M. W., 163; M. P., 235-240C (decomposes); Purity, 96%, minimum. Characteristics: tan to gray powder. Solubility: very slightly soluble in water; soluble in acetone, glacial acetic acid, dioxane, dimethylformamide, dimethyl sulfoxide. Chemical properties: reacts readily with hydroxyl, mercaptan, amine, and active methylene groups. Suggested uses: preparation of anthranilates, o-amino benamides, o-amino thiobenzoates, and 4-hydroxyquinolines. Availability: commercial quantities. Maumee Chemical Co.

ISETHIONIC ACID, SODIUM SALT
(sodium 2-hydroxyethanesulfonate)

$HOCH_2CH_2SO_3Na$; M. W., 148; Purity: 95% minimum. Characteristics: white powder. Solubility: soluble in water and alcohol. Chemical properties: typical reactions of hydroxy acids. Suggested uses: as an intermediate for surfactants. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

ISOBUTYL TOSYLATE
(isobutyl p-toluenesulfonate)

M. W., 228; Purity: over 93%. Characteristics: mobile, pale yellow liquid, slight odor. Solubility: insoluble in water; soluble in most common organic solvents. Chemical properties: takes part readily in most substitution reactions to introduce the isobutyl group. Suggested uses: as an intermediate for the introduction of the isobutyl group under mild conditions. Availability: commercial quantities. Fine Organics, Inc.

C^{14}-L-ISOLEUCINE

$C^{14}_6H_{13}O_2N$; M. W., 131.1; Purity: radiochemically pure (by chromatography). Suggested uses: for biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

ISOOCTANOIC ACID

$C_7H_{15}COOH$; M. W., 144.21; Sp. G., 0.9139 at 20/20C; Purity, 100%; B. P., 223-230C. Characteristics: slightly musty, characteristic odor, colorless liquid. Solubility: soluble in common organic solvents. Suggested uses: as an intermediate for surface coatings; in metallic soaps used as paint driers. Availability: experimental quantities. Gulf Oil Corp., Petrochemicals Dept.

ISOOCTYL ALCOHOL (Inhibited)

$C_8H_{18}O$; Constituents: Isooctyl alcohol containing an inhibitor; M. W., 130.22; Sp. G., 0.834 at 20/20C; Purity: 99%, min.; B. P., 184-191C. Characteristics: colorless liquid, characteristic odor. Solubility: soluble in organic solvents, insoluble in water. Chemical properties: the inhibitor protects the alcohol during acid catalyzed esterification against color formation; yields very light-colored esters requiring little or no decolorizing. Suggested uses: to produce esters for plasticizer use. Availability: commercial quantities. Enjay Co., Inc., Chemicals Division.

ISOOCTYL ALDEHYDE

$C_7H_{15}CHO$; M. W., 128.21; Sp. G., 0.8304 at 60/60F; Purity, 100%; B. P., 157-162C. Characteristics: characteristic odor, colorless liquid. Solubility: soluble in common organic solvents. Suggested uses: as a chemical intermediate. Availability: experimental quantities. Gulf Oil Corp., Petrochemicals Dept.

ISOOCTYLAMINE

$C_8H_{17}NH_2$; M. W., 129.24; Sp. G., 0.7896 at 60/60F; Purity, 99%; B. P., 160-170C. Characteristics: mild amine odor, colorless liquid. Solubility: soluble in common organic solvents. Suggested uses: as a surface active agent; in metal deactivators; in pigment dispersions; as an intermediate for lube additives. Availability: experimental quantities. Gulf Oil Corp., Petrochemicals Dept.

ISOPHTHALOYL CHLORIDE

$C_8H_4O_2C_{12}$; M. W., 203.03; M. P., 44C (pure); Purity, > 98%; B. P., 276C. Characteristics: white crystalline product having a pungent odor. Solubility: soluble in n-hexane, benzene and carbon tetrachloride. Chemical properties: a very reactive dibasic acid chloride that undergoes typical acid halide reactions. Suggested uses: in the formation of long chain polymeric materials of the polyester and polyamid types. Availability: pilot-plant quantities. Hooker Electrochemical Co.

ISOPROPYL CARBAMATE

$(CH_3)_2$ $CHOCONH_2$; M. W., 103; M. P., 94-95C; Purity 99.5%. Characteristics: white crystals. Solubility: 4.5% by weight in water (25C); insoluble in hexane and carbon tetrachloride; soluble in benzene and ethanol. Suggested uses: as a chemical intermediate; solvent possibilities. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

ISOPROPYL CHLORIDE (2-chloropropane)

$CH_3CH_2ClCH_3$; M. W. 79.55; Sp. G. 0.859 (pure compound); M. P. —117.6 C; Purity: 95% minimum; B. P. 34.8 C. Characteristics: colorless liquid. Solubility: sparingly soluble in water; soluble in alcohol and ether. Chemical properties; undergoes typical reactions of secondary alkyl halide. Suggested uses: as a chemical intermediate. Availability: experimental quantities. Shell Chemical Corp., Market Development Dept.

ISOPROPYL TOSYLATE
(isopropyl p-toluenesulfonate)

M. W., 214; Sp. G., 1.14; M. P., 15-20C; Purity: over 93%. Characteristics: light yellow, mobile liquid, faint odor. Solubility: insoluble in water, soluble in most common organic solvents. Chemical properties: takes part readily in most substitution reactions to introduce the isopropyl group. Suggested uses: as an intermediate for the introduction of the isopropyl group under mild conditions. Availability: commercial quantities. Fine Organics, Inc.

ISOSINCHOMERONIC ACID
(pyridine 2,5 dicarboxylic acid)

C_5H_3N $(COOH)_2$; M. W., 167.12; M. P., 236C (decomposes); Purity, 95% (anhydrous). Characteristics: light tan to yellow powder. Solubility: in gms./100cc. at 25C; ethanol, 0.36; water, 0.21; benzene, 0.08; ether, 0.08. Suggested uses: as an intermediate in the preparation of pharmaceuticals, insecticides, polymers and dyestuffs. Availability: commercial quantities. Ansul Chemical Co., Chemical Division.

ISOSINCHOMERONIC ACID
(2, 5-pyridinedicarboxylic acid)

C_5H_3N $(COOH)$ 2° H_2O; M. W., 185.13; M. P., 242-243C (decomposition in sealed tube); Purity: 99.5%; B. P., sublimes. Characteristics: odorless. Solubility: slightly soluble in water, alcohol and ether; soluble in hot aqueous hydrochloric acid; soluble in alkaline solution. Chemical properties: heterocyclic dicarboxylic acid containing a basic nitrogen in the ring. Suggested uses: as an intermediate for nicotinic acid, insect repellents, plastics, fibers. Availability: semicommercial quantities. Cowles Chemical Co., Organic Chemical Department.

JBH

Constituents: bleached hardwood sulfate pulp. Chemical properties: papers made with this pulp give new qualities of opacity, brightness, strength, formation and bulk. Suggested uses: in paper making, including book and print papers. Availability: commercial quantities. Rayonier, Inc.

LAEVO LINALOOL F.B. (l-linalool)

$C_{10}H_{18}O$; M.W. 154.24; Sp. G. 0.868 at 25/25 C; Purity: 95%. Characteristics: nearly colorless liquid. Solubility: clearly soluble in 4.5 volumes and more of 60% alcohol. Chemical properties: a natural laevo linalool; the same type which occurs in such essential oils as lavender, lavandin, bergamot, neroli, etc. Suggested uses: in perfumes to obtain especially distinctive notes characteristic of natural l-linalool. Availability: commercial quantities. Fritzsche Brothers, Inc.

LAURYL TOSYLATE
(n-dodecyl para-toluenesulfonate)

M.W. 336; Purity: over 93% as ester. Characteristics: mobile, pale yellow liquid, slight odor, may solidify below 20 C. Chemical properties: material is available with two different compositions, having a lauryl ester content, based on total ester present, of 80% and 95% respectively; it is a highly reactive alkylating agent that takes part readily in most substitution reactio s to introduce the n-dodecyl group. Suggested uses: as an intermediate for the introduction of the n-dodecyl group. Availability: commercial quantities. Fine Organics, Inc.

C^{14}-L-LEUCINE

$C^{14}_6H_{13}O_2N$; M. W., 131.1; Purity: radiochemically pure (by chromatography). Suggested uses: in biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

LEVULINIC ACID

$CH_3COCH_2CH_2COOH$; M.W. 116.11; Sp. G. 1.1447 at 25/4 C; M.P. 33-35 C; B.P. 245-6 C (760 mm.). Characteristics: burnt-sugar odor; light yellow color; liquid may be partially crystallized in winter. Solubility: completely soluble in water, alcohols, esters, ketones, aromatic hydrocarbons and chlorinated hydrocarbons; insoluble in aliphatic hydrocarbons. Chemical properties: levulinic acid is the simplest member of the gamma-ketocarboxylic acids; reacts as a carboxylic acid and functions as a ketone. Suggested uses: in organic synthesis. Availability: semicommercial quantities. The Quaker Oats Co., Chemicals Dept.

LIGHT ABSORBER DBR
2,4-dibenzoylresorcinol (16-20% of 4,6-isomer)

$C_6H_3COC_6H_3(OH)_2COC_6H_5$; M.P., 125-128 C; Characteristics: nearly odorless, light yellow powder. Solubility: moderately soluble in organic solvents; slightly soluble in water. Chemical properties: exceptional resistance to ultraviolet breakdown. Suggested uses: as an absorber where maximum permanence and stability are required. Availability: commercial quantities. Dow Chemical Co., Technical Service and Development Division.

LIGHT ABSORBER HCB
5-chloro-2-hydroxy benzophenone

$C_6H_4COC_6H_4OHCl$; M.P. 93-95 C. Characteristics: nearly odorless yellow powder. Solubility: soluble in organic solvents; slightly soluble in water. Chemical properties: does not react with aluminum pigments. Suggested uses: as an absorber for metallized plastic products. Availability: commercial quantities. Dow Chemical Co., Technical Service and Development Division.

LIGHT ABSORBER TBS
(4-tert-butyl phenyl salicylate)

$C_6H_4OHOOCC_6H_4C(CH_3)_3$; M.P., 62-64 C. Characteristics: off-white crystals with slight odor. Solubility: soluble in organic solvents; slightly soluble in water. Chemical properties: completely odorless in plastic formulations; low order of chronic oral toxicity by injection. Suggested uses: stabilizer for food packaging films. Availability: commercial quantities. Dow Chemical Co., Technical Service and Development Division.

LILIAL

Constituents: a pure aromatic aldehyde. Sp. G. 0.942-0.949 at 25/25 C; Purity: carbonyl value 247-274. Characteristics: colorless to slightly yellow liquid having a powerful and diffusive odor suggesting linden blossoms and fragrant lilies. Solubility: soluble in 5 volumes of 80% alcohol; soluble in most perfume materials; insoluble in propylene glycol and glycerol. Chemical properties: a stable synthetic aldehyde with an exceptionally diffusive floral odor which has been associated with many of the expensive natural floral absolutes; will not cause discoloration. Suggested uses: to improve the floralcy of a wide variety of blended odors as well as a base for the development of newer fragrances with unusual stability and economy; technical bulletin GD-5 available. Availability: commercial quantities. Givaudan-Delawanna, Inc.

LITHIUM METAL DISPERSIONS

Constituents: 30% Li, 69.1% Drakeol 35, 0.9% oleic acid and 30% Li, 70% petrolatum (colorless). Purity: 99.8+% (metal purity). Characteristics: suspension of lithium in oil, lithium particles average between 10-25 microns in diameter. Chemical properties: dispersion is much more chemically stable than metal in normal forms. Suggested uses: in the preparation of organic and inorganic lithium derivatives; stereospecific catalyst for olefin polymerization to "natural" synthetic rubbers. Availability: semicommercial quantities. Lithium Corporation of America, Inc., Product Research and Development Division.

NEW CHEMICALS FOR INDUSTRY

LITHIUM RICINOLEATE

M. W., 302; M. P., 175 C. Characteristics: fine white powder (also available as 50% aqueous paste). Chemical properties: in alkyd manufacturing, speeds alcoholysis, produces lighter-colored monoglycerides, and eliminates colloidal formation associated with lime and litharge catalysts. Suggested uses: alcoholysis or transesterification catalyst for alkyd manufacture. Availability: commercial quantities. The Baker Castor Oil Co.

LOROL® 11 FATTY ALCOHOL
(technical lauryl alcohol)

$CH_3(CH_2)_{10}CH_2OH$; Constituents: essentially a mixture consisting of 80% lauryl alcohol and 20% myristyl alcohol. M.W. 186.33; Sp. G. 0.831 at 24/4 C; M.P. 23.95 C; Purity: 80%; B.P. 259 C. Characteristics: colorless, viscous liquid with faint fatty odor. Solubility: insoluble in water; miscible above 30 C with methanol, 95% ethanol, ethyl ether and benzene. Chemical properties: can be esterified with acids, oxidized to aldehydes and acids, chlorinated, sulfated with chlorosulfonic or sulfuric acids; it is noncorrosive. Suggested uses: as an intermediate for laur l chloride, dodecyl mercaptan, lauryl sulfate and sodium lauryl sulfate, lauryl methacrylate, and other organic chemicals. Availability: commercial quantities. E. I. du Pont de Nemours & Co., Inc., Polychemicals Dept.

L P S 4002 (stearyl dimethyl benzyl ammonium chloride)

M.W. 440; Purity: 95% minimum. Characteristics: white crystalline powder. Solubility: slightly soluble in water; soluble in alcohol. Suggested uses: in pharmaceutical and cosmetic preparations. Availability: commercial quantities. Onyx Oil & Chemical Co., Industrial Division.

MALONALDEHYDE TRIMETHYL ETHYL DIACETAL
[1.1.3 trimethoxy-3-ethoxypropane]

$C_8H_{18}O_4$; M. W., 178.22; Purity: 100-103% as malonaldehyde; B. P., 180-200 C. Solubility: fairly soluble in water and the usual polar organic solvents. Chemical properties: stable, inexpensive source for malonaldehyde. Suggested uses: in organic syntheses, as a protein insolubilization cross-linking agent. Availability: semicommercial quantities. Kay-Fries Chemicals, Inc.

MARCO MX-314
(unsaturated polyester resin)

Constituents: a liquid unsaturated polyester employing styrene monomer. Sp. G., 1.09; Purity: 100% reactive resin. Characteristics: yellow in color, possesses a styrene odor and a viscosity at 25 C of 500-800 centipoises. Solubility: solvents are not recommended for usage with polyesters; where further dilution is required, the addition of styrene monomer or other vinyl type monomers is recommended. Chemical properties: this resin possesses good resistance to mild acids and alkali; characterized by good impact qualities, good flexibility and excellent resistance to attack by oil and gasoline. Suggested uses: this thermosetting resin is recommended as a flexible joint material for clay pipe installation where it is used in combination with a rubber or neoprene gasket to effect the seal between two lengths of pipe. Availability: commercial quantities. Celanese Corp. of America, Marco Resin Division.

MAGON
(1-azo-2-hydroxy-3-[2,4-dimethylcarboxanilido]-naphthalene-1'-[2-hydroxy] benzene)

$C_{25}H_{21}O_3N_3$; M.W. 386.168; M.P. 246-7C; Characteristics: red powder. Solubility: insoluble in water; soluble in alcohol and many organic liquids. Chemical properties: sensitive chemical reagent for colorimetric determination of magnesium: sensitivity: 1 part of magnesium in 50 million parts of solution. Availability: experimental quantities. LaMotte Chemical Products Co.

MANGANESE (OUS) FLUORIDE (anhydrous)

MnF_2; M.W. 92.93; Purity: commercial and electronic grade. Characteristics: light red-brown powder. Solubility: insoluble in water, alcohol, ether, dissolved by mineral acids. Suggested uses: as a flux for electronics uses. Availability: semicommercial quantities. City Chemical Corp.

MAPICO TAN #10
(zinc ferrite)

$ZnO.Fe_2O_3$; M.W. 241.08; Sp.G 5.24; Purity: 99.5-99.7%. Characteristics: powder, 0.4-1.2 microns. Solubility: insoluble except in strong acids. Chemical properties: alkali-fast, light-fast, heat-stable. Suggested uses: as a bright-tan pigmentary heat-stable material, lighter and brighter than heretofore available in this composition; useful in cement products, rubber, baking enamels, other paints and in many other pigmentary and reagent applications. Availability: commercial quantities. Columbian Carbon Co., Mapico Color Unit.

MAPROFIX TLS CONCENTRATE
(triethanolamine lauryl sulfate)

$C_{12}H_{25}SO_4H.N(C_2H_5OH)_3$; M.W. 429; M.P. 70C; Purity: 75%. Characteristics: soft white solid. Solubility: soluble in water and alcohol. Outstanding features: high concentration. Suggested uses: in cosmetics, detergents. Availability: commercial quantities. Onyx Oil & Chemical Co., Industrial Division.

MAPROFIX 2109
(diethanolamine lauryl sulfate)

$C_{12}H_{25}SO_4H.HN(C_2H_5OH)_2$; M.W. 385; M.P. 70C; Purity: 75%. Characteristics: soft light-amber paste. Solubility: soluble in water and alcohol. Outstanding features: high concentration. Suggested uses: in cosmetics, detergents. Availability: commercial quantities. Onyx Oil & Chemical Co., Industrial Division.

MARACARB X-1

Constituents: mixture of salts of wood sugar acids and lignosulfonic acid. Purity: 40% aqueous. Characteristics: brown liquid. Chemical properties: sequestrant and crystal growth inhibitor. Suggested uses: in the stabilization of 2-4D amine concentrates. Availability: semicommercial quantities. Marathon Corp.

MARACON
(modified calcium lignosulfonate)

Characteristics: brown, amorphous powder. Solubility: soluble in water. Chemical properties: dispersing agent for portland cement. Suggested uses: as a water-reducing admixture for ready-mixed concrete. Availability: commercial quantities. Marathon Corp.

MARLEX® 50 POLYETHYLENE

Comes in 4 types, ranging from melt index 0.6 to 5.5; softening temperature 260 F; impact strength 3.0 ft. lb. in. indicates the desirable balance of properties of this thermoplastic. Its general toughness, chemical resistance, impermeability and temperature resistance suggest wide fields of application, both old and new. Ready fabrication by conventional plastics processing equipment simplifies its use in the fields of injection molding, extrusion and blow molding. Availability: commercial quantities. Phillips Chemical Co.

MENTHANE DIAMINE
(1.8-diamino-p-menthane)

M.W. 170; Density: 7.59 lb./gal. F.P.—45C; Refractive Index: 1.4794 at 25C; B.P. 107-126C (10mm.). Viscosity: 7.5 centistokes at 100F; Flash point 215F. Characteristics: a clear liquid with a characteristic terpene odor. Solubility: miscible with water and organic solvents, such as alcohols, acetone, benzene, and petroleum ether. Chemical properties: menthane diamine can undergo amino hydrogen substitution reactions to form secondary amines; the steric hindrance prevents tertiary amine formation. Suggested uses: found to be an effective curing agent for epoxy resins; it is also an intermediate for menthane diisocyanate—which may be useful as a raw material for polyurethanes. Availability: semicommercial quantities. Rohm & Haas Co., Special Products Division.

MENTHANYL ACETATE

Constituents: a pure aromatic ester. Sp.G. 0.9328-0.9337 at 25/25C; Purity: 95-100%. Characteristics: a colorless oily liquid having a clean, fresh odor reminiscent of oils of bergamot and petitgrain. Solubility: compatible with essential oils and other aromatic materials used in perfumery; relatively insoluble in water and glycerine. Chemical properties: as an ester, shows resistance to saponification, which enhances its performance and stability in alkaline media. Suggested uses: for extending and developing artifical oils of bergamot, petitgrain and lavender; also for improving the odor performance of odorants containing linalyl acetate; technical bulletin GD-4 available. Availability: commercial quantities. Givaudan-Delawanna, Inc.

TERTIARY HEPTYL MERCAPTAN

$C_7H_{15}SH$; M. W., 132.26; Sp. G. 0.8495 at 20/4C; Purity, 98.8 mol—% as total mercaptan; B. P. 144.4C. Characteristics: yellow color. Suggested uses: for organic syntheses, solvent, modifier for rubber polymerization. Availability: experimental quantities. Phillips Petroleum, Special Products Division.

b-MERCAPTOPROPIONIC ACID

$HSCH_2CH_2CO_2H$; M.W. 106; Sp.G. 1.218; Purity: 99% B.P. 110.5-111.5C at 15mm. Characteristics: clear liquid. Solubility: soluble in water, alcohol, benzene, ether. Suggested uses: as a pharmaceutical intermediate. Availability: semicommercial quantities. Evans Chemetics, Inc., Chemical Division.

MESYL CHLORIDE
(methanesulfonyl chloride)

CH_3SO_2Cl; M.W. 114.5; M.P. —32C; Purity: 98+% B.P. 164C. Characteristics: colorless to light yellow liquid with an irritating lachrymatory odor. Solubility: soluble in most organic solvents; insoluble in water, but is slowly hydrolyzed in cold water; hydrolysis is rapid in hot water alkaline conditions. Chemical properties: acts like a normal reactive sulfonyl chloride; reacts with reducing agents, alcohols, phenols, ammonia and amines, active methylene compounds and other groups; esterifies cellulose and other carbohydrates. Suggested uses: for flameproofing of cotton, rayon, paper; in the manufacture of drugs for the treatment of leukemia and cancerous tumors; in the preparation of dyestuffs and other organic materials. Availability: semicommercial quantities. Stauffer Chemical Co., Market Development Dept.

METHALLYL ACETATE
(isobutenyl acetate)

$CH_2C(CH_3)CH_2OCOCH_3$; M.W. 114.14; Sp. G. 0.9162 at 20/20 C; Purity: 97.0% min.; B.P. 124.5-125 C. Characteristics: colorless liquid; color: 20 APHA (max.). Suggested uses: largely used as a monomer but also of interest in preparing methallyl derivatives of value in polymer, adhesives, protective coatings, molding powders, castings, laminates, safety glass liners, specialty rubbers and other products. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

METHALLYL ALCOHOL
(2-methyl-2-propen-1-ol)

$CH_2C(CH_3)CH_2OH$; M.W. 72.10; Sp. G. 0.8515 at 20/4 C; Purity: 98.0% mm.; B.P. 114.5 C. Characteristics: colorless liquid; color, 20 APHA (max.). Suggested uses: a reactive intermediate for the preparation of methallyl derivatives as well as being a monomer in polymerization reactions. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

METHALLYL CARBAMATE

$CH_2CCH_3CH_2OCONH_2$; M.W. 115; Sp. G. 1.033 at 55/55 C; M.P. 53.5—54.6 C; Purity: 99.5%; Characteristics: white crystals. Solubility: 40% by weight in water at 25 C; insoluble in hexane, soluble in benzene, ethanol, carbon tetrachloride. Suggested uses: as a chemical intermediate: solvent possibilities. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

METHALLYL CHLOROFORMATE

$CH_2CCH_3CH_2OCOCl$; M.W. 134.5; Sp. G. 1.0915 at 20/20 C; Purity: 98.4%; B. P. 58 C (50 mm); 74 C (100 mm.). Characteristics: water-white liquid. Solubility: soluble in benzene, hexane, ethanol and carbon tetrachloride. Suggested uses: as a reactive intermediate, particularly in reactions with active hydrogen compounds. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

METHYLALUMINUM SESQUICHLORIDE

Constituents: a 50:50 mixture of dimethylaluminum chloride and methylaluminum di-

*Registered trademark.

chloride. $(CH_3)_3Al_2Cl_3$; Purity: methyl sesquichlorides, 95% min., chloride, 50% min. Characteristics: form: liquid; color: straw colored to clear. Chemical properties: 1) spontaneously flammable in air, reacts violently in water; 2) reacts with NaH to give corresponding hydrides. Suggested uses: polymerization catalyst and chemical intermediate. Availability, semicommercial quantities. National Distillers and Chemical Corp. U.S. Industrial Chemicals Co. Division.

2-METHYL-1-BUTANOL

$CH_3CH_2CH(CH_3)CH_2OH$; M.W. 88.15; Sp. G. 0.8190 at 20/20 C; B.P. 128 C (at 760 mm.). Characteristics: a water-white liquid. Solubility: in water, 1.6% by weight at 20 C; completely soluble in most common organic solvents. Chemical properties: undergoes reactions typical of alcohols; the α-methyl substitution gives added heat stability to esters. Suggested uses: as a chemical intermediate for mining chemicals, oil additives, pharmaceuticals, surface-active agents, resins, plasticizers; for solvent applications. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

2-METHYLBUTENE-1

C_5H_{10}; M.W. 70.130; Sp. G. 0.6504 at 20/4 C; M. P. —137.58 C; Purity: research grade 99.91 mol %. Suggested uses: in organic syntheses; as a laboratory standard (calibrating material for spectrometric and chromatographic instruments). Availability: semicommercial quantities. Phillips Petroleum, Special Products Division.

METHYL BUTENOL
(2-methyl-3-buten-2-ol)

M.W. 86.13; Sp. G. 0.8249 at 20/20 C; M.P. —30.5 C; Purity: 95% min.; B.P. 96-97.5 C. Characteristics: clear, colorless liquid with isopropanol-like odor. Solubility: 13.1 weight % in water at 20 C; miscible with acetone, benzene, carbon tetrachloride, cellosolve, ethyl acetate, mineral oil and most common organic solvents. Chemical properties: rearranges to 2-methyl-2-buten-4-ol; esterification; chloro and bromo derivatives; dehydrates to isoprene. Suggested uses: in syntheses (perfumes, food colors and flavors, pharmaceuticals); as a source of isoprene; for copolymerization. Availability: semicommercial quantities. Air Reduction Chemical Co.

METHYL CARBAMATE

CH_3OCONH_2; M.W. 75; Sp. G. 1.152 at 55/55 C; M. P. 55.0 C; Purity: 99.5%. Characteristics: white crystals; light-tan melt. Solubility: in water 217% by weight at 11 C; insoluble in hexane and carbon tetrachloride; soluble in benzene and ethanol. Suggested uses: as a chemical intermediate; solvent possibilities. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

2-METHYL 3 CARBOXY 4 HYDROXY QUINOLINE

$C_{11}H_9O_3N$; M.W. 203; M.P. 245 C; Purity: 98%. Characteristics: fine white crystals. Solubility: insoluble in ethyl ether, benzol, hot water. Suggested uses: as a pharmaceutical intermediate. Availability: experimental quantities. Maumee Chemical Co.

METHYL CHLOROFORMATE

CH_3OCOCl; M.W. 94.5; Sp. G. 1.2273 at 20/20 C; Purity: 98.8%; B.P. 70-72 C. Characteristics: water-white liquid. Solubility: soluble in hexane, benzene, ethanol and carbon tetrachloride. Suggested uses: as a reactive intermediate, particularly in reactions with active hydrogen compounds. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

2-METHYL-2-ETHYL-1,3-DIOXOLANE

$(CH_3)(C_2H_5)COCH_2CH_2O$; M.W. 116.16; Sp. G. 0.9392 at 20/20 C; B.P. 117.6 C (at 760 mm.). Characteristics: water-white color. Solubility: in water, 2.2% by weight at 20 C; solubility of water in, 1.23% by weight at 20 C; at 25 C miscible in all proportions with acetone, benzene, ethyl ether, heptane, methanol, carbon tetrachloride. Suggested uses: as a selective blocking agent for keto groups in the syntheses of complex molecules such as testosterone, progesterone, other hormones and steroids, flavoring materials, agricultural chemicals; as a reaction medium; as an extraction solvent. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

METHYLFURAN

M.W. 82.10; Sp. G. 0.915 at 20/4 C; M.P. —88C; B.P. 62-64 C (760 mm.). Characteristics: ether-like odor; colorless, mobile liquid. Solubility: insoluble in water; soluble in most common organic solvents. Chemical properties: a cyclic diene with ether-like properties; it can be hydrogenated to methyltetrahydrofuran; hydrolyzed to open chain compounds, condensed by the Mannich reaction and polymerized by strong alkalies and acids. Suggested uses: as a solvent and chemical intermediate. Availability: semicommercial quantities. The Quaker Oats Co., Chemicals Dept.

METHYL HXDROXY BUTANONE
(3-methyl-3-hydroxy-2-butanone)

M.W. 102.13; Sp. G. 0.9553 at 20/20 C; M.P. —86.5 C; Purity: 95%; B.P. 140.3 C. Characteristics: clear, colorless liquid with a sweet, camphor odor. Solubility: miscible with water, acetone, benzene, carbon tetrachloride, Cellosolve, mineral spirits, soybean oil, petroleum ether and most common organic solvents. Chemical properties: reduced to glycol and reductive amination; reaction with acetylenics yields acetylenic diols, triols, tetrols; dehydration to methyl isopropenyl ketone; homocondensation; esterification. Suggested uses: in syntheses (pharmaceuticals and other chemicals); as a specialty solvent; ultraviolet absorber. Availability: semicommercial quantities. Air Reduction Chemical Co.

n-METHYL ISATOIC ANHYDRIDE
(1-methyl-4H-3,1-benzoxazine-2,4-dione)

$C_9H_7O_3N$; M.W. 175; M.P. 175 C; Purity: 97%. Characteristics: white crystals. Solubility: soluble in acetone, dioxane, dimethyl formamide, dimethyl sulfoxide. Chemical properties: reacts with hydroxyl, amine, and mercaptan groups. Suggested uses: preparation of n-methyl anthranilates for flavor and perfume use. Availability: semicommercial quantities. Maumee Chemical Co.

n-METHYL-n-NITROSO-p-TOLUENESULFONAMIDE

$CH_3C_6H_4 \cdot SO_2N(NO)CH_3$; M.W. 214.25; M.P. 60-62 C; Purity: 99%. Characteristics: yellow crystalline powder. Solubility: soluble in ether, alcohol; insoluble in water. Chemical properties: affords a convenient source of diazomethane; low toxicity and good stability. Suggested uses: in synthesizing methyl esters that are otherwise difficult to make; increasing the carbon chain of a carboxylic acid (Arndt-Eistert synthesis), etc. Availability: semicommercial quantities. The Matheson Co., Inc. Matheson Coleman & Bell Division.

METHYL PARATHION
(O,O-dimethyl,O-paranitrophenyl phosphorothionate)

$(CH_3O)_2PSOC_6H_4NO_2$; M.W. 263; Sp. G. 1.105-1.153 at 25/25 C; Purity: 80% min.; B.P. decomposes violently at 150 C. Characteristics: amber to dark brown solution. Solubility: soluble in most organic liquids; insoluble in water; hydrolyzes slowly. Chemical properties: thermally stable up to 80 C; strong acetyl cholinesterase inhibitor; toxicity to mammals 12-30 mg./kg.; antidote: atropine. Suggested uses: acaricide; insecticide. Availability: commercial quantities. Victor Chemical Works, Special Products Division.

2-METHYL 1,3-PENTANEDIOL

$CH_3CH_2CH(OH)CH(CH_3)CHOH$; M. W. 118.17; Sp. G. 0.9745 at 20/20 C; B.P. 220.3 C (at 760 mm.). Solubility: completely soluble in water. Suggested uses: as a chemical intermediate for the production of plasticizers, polyesters, synthetic lubricants. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

2-METHYLPENTANOIC ACID

$CH_3CH_2CH_2CH(CH_3)COOH$; M.W. 116.16; Sp. G. 0.9242 at 20/20 C; B.P. 196.4 C (at 760 mm.). Characteristics: water-white. Solubility: in water, 1.3% by weight at 20 C. Chemical properties: undergoes reactions typical of organic acids; the α-methyl substitution gives added thermal stability to esters. Suggested uses: as an intermediate for synthetic lubricants, plasticizers, vinyl stabilizers, metallic salts, nonyellowing alkyd resins. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

4-METHYL PENTANOIC ACID

M.W. 116; Sp. G. 0.921 at 20/4 C; Purity: 98-99%; B.P. 110-112 C at 20 mm. Characteristics: colorless liquid. Suggested uses: in paint drier and vinyl stabilizer fields; also can be reacted with primary alcohols for use in the plasticizer field. Availability: semicommercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

n-METHYL PYRROLIDINE

$CH_3NC_4H_8$; M.W. 85.15; Sp. G. 0.79; Purity: technical grade, 95%+; B.P. 80-83 C. Characteristics: colorless liquid; penetrating amine-like odor. Solubility: soluble in water, alcohol, benzene, ether. Chemical properties: strong base. Suggested uses: as a pharmaceutical intermediate. Availability: semicommercial quantities. Ansul Chemical Co., Chemical Division.

METHYLTETRAHYDROFURAN

M. W., 86.13; Sp. G., 0.853 at 20/4 C; B. P., 80 C (760 mm.). Characteristics: ether-like odor; colorless, mobile liquid. Solubility: soluble in most organic solvents; in water, 13.87 gms./100 gms. at 25 C. Chemical properties: a cyclic ether that can be reduced to 1,3-pentadiene, halogenated to 1,4-dibromopentane and converted to other heterocyclic compounds. Suggested uses: as a solvent and chemical intermediate. Availability: experimental quantities. The Quaker Oats Co., Chemicals Dept.

M.I.C.
(3-methyl-6-isopropyl catechol)

$C_{10}H_{14}O_2$; M. W. 166.2; Sp. G., 1.035 at 60/25 C; M. P., above 40 C; Purity above 97%; B. P., 266 C. Characteristics: white, crystalline solid. Solubility: at 25 C, about 850 g./100 g. of ethanol, about 350 g./100 g. of benzene, about 0.9 g./100 g. of water. Chemical properties: polymerization inhibitor. Suggested uses: as a polymerization inhibitor for butadiene and styrene. Availability: commercial quantities. Heyden Newport Chemical Corp., Newport Industries Co. Division.

MIRAWHITE® T64 BRIGHTENER

Constituents: optical brightener solution. Solubility: water dispersible. Suggested uses: gives excellent shades of white on cotton, nylon and acetate; stable to bleach. Ability: commercial quantities. Sterling Drug, Inc., Hilton-Davis Chemical Co. Division.

MGK REPELLENT 326
(di-n-propyl isocinchomeronate)

B. P., 186 to 187 C at 1.25 mm. Purity: 99%-100%. Characteristics: no characteristic odor; amber liquid. Solubility: soluble in deodorized kerosene, aromatic petroleum solvents and common organic solvents such as methyl ethyl and isopropyl alcohol and florinated hydrocarbon propellents. Chemical properties: outstanding feature is its repellency to flies. Suggested uses: use as personal repellent to biting flies and as a repellent in cattle sprays against stable flies, horse flies, horn flies and house flies; excellent residual repellent for flies when used on wall surfaces in barns and food processing plants. Availability: commercial quantities. McLaughlin Gormley King Co., Chemical Division.

MONDUR CB-75
(isocyanate adduct)

Constituents: 75% solids in ethyl acetate. Sp. G., 0.99. Characteristics: odorless, pale-yellow liquid. Solubility: soluble in esters, ketones, chlorinated hydrocarbons, partially soluble in toluene, xylene, high solvency naphthas, hexane, mineral spirits. Chemical properties: at room temperature, a reactive isocyanate adduct; reacts with active hydrogen containing compounds such as polyesters, alkyds, epoxies, processed natural oils, silicones, polyethers, coal tars, etc. nonirritating isocyanate of low vapor pressure. Suggested uses: used to modify oils & resins to upgrade properties; used in two-package type urethane coatings and adhesives; used in urethane rigid foams. Availability: commercial quantities. Mobay Chemical Co.

MONDUR SH
(polyisocyanate)

Sp. G., 1.35; M. P., 110 C. Characteristics: light-yellow powder. Solubility: soluble in esters, ketones, high solvency naphthas. Chemical properties: polyisocyanate that is unreactive at room temperatures. Suggested uses: in formulation of one-component, room-temperature-stable, high-temperature-resistant and chemical- and solvent-resistant wire coatings and brake-type surface coatings. Availability: commercial quantities. Mobay Chemical Co.

MONOALLYLAMINE (2 propenylamine)

$CH_2{=}CH{-}CH_2{-}NH_2$; M.W. 57.09; Sp. G. 0.7627 (pure compound) at 20/40 C; M. P. 52.9 C; B. P. —88.2 C. Solubility: complete in water, acetone, toluene and octane at 20 C. Chemical properties: a highly reactive material combining in one molecule a primary amine and a monoolefin; readily forms amides, imides and carbamates, leaving the double bond for further reaction, such as halogenation and polymerization. Suggested uses: in pharmaceuticals (sedatives, diuretics, antiseptics); in agricultural chemicals (bactericides, fungicides); as an intermediate in resin manufacture. Availability: semicommercial quantities. Shell Chemical Corp., Market Development Dept.

MONOISOPROPYLBIPHENYL

$(CH_3)_2CHC_{12}H_9$; M. W., 196.3; Sp. G., 0.979 at 25 C; M. P.—54 C; Purity: 62% meta isomer, 38% para isomer; B. P., 295-300 C at 760 mm. Characteristics: water-white liquid. Chemical properties: a radiation-resistant compound with a fluid range of —50 F to 570 F.

NEW CHEMICALS FOR INDUSTRY

Suggested uses: as a chemical intermediate; heat exchanger fluid where a pure hydrocarbon with excellent radiation resistance, thermal stability, and/or electric characteristics are required; plasticizer and high temperature and radiation resistant dielectric. Availability: semicommercial quantities. Monsanto Chemical Co., Organic Division.

MONOMER MG-1
(α polyethylene glycol dimethacrylate)

Sp. G., 1.0822 at 20/20 C. Chemical properties: a nonvolatile reactive monomer. Suggested uses: as a dispersant for polyvinyl chloride resins for plastisol applications, polymerizing during the plastisol fusion cycle to yield compatible, rigid or semirigid resins; cross-linking agent with methacrylate and unsaturated polyester resins to impart improved scratch resistance, toughness, hardness and gloss. Availability: commercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

MOROC® CORE BINDER

Constituents: a liquid sodium silicate base mixture. Sp. G., 1.5 g./cc. Characteristics: light-amber colored, viscous liquid. Solubility: soluble in water in all proportions. Chemical properties: binder produces cores of high strength, reacts rapidly with CO_2, and is easily mixed with sand. Suggested uses: used as a binder for sand in the production of foundry cores and molds by the silicate-CO_2 process. Availability: commercial quantities. Diamond Alkali Co., Silicate-Detergent-Calcium Division.

MOROC® CORE PASTE

Constituents: a liquid sodium silicate base mixture. Sp. G., 1.65 g./cc. Characteristics: a black, viscous paste. Solubility: soluble in water. Chemical properties: rapid adhesion with air setting and produces a strong bond. Suggested uses: as an adhesive for joining sections of silicate-CO_2 cured cores, oil or resin bonded cores, or shell molds. Availability: commercial quantities. Diamond Alkali Co., Silicate-Detergent-Calcium Division.

MO 333 TOSYLATE
(methoxy poly(ethyleneoxy) ethyl para-toluenesulfonate)

M. W., around 500; Purity: over 93%. Characteristics: pale yellow, mobile liquid, faint odor. Chemical properties: readily introduces a high-molecular-weight alkoxy group into organic molecules. Suggested uses: as an intermediate in the formation of products containing a high-molecular-weight alkoxy group. Availability: commercial quantities. Fine Organics, Inc.

MULTANIL FLO
(urethane prepolymer)

Constituents: 30% solution in methyl Cellosolve acetate. Characteristics: straw colored liquid. Chemical properties: when used in urethane adhesives provides powerful bonding properties; adhesives are resistant to drycleaning solvents and soap and water washing. Suggested uses: as a base resin formulated for a two component adhesive and suited for flock printing. Availability: commercial quantities. Mobay Chemical Co.

MULTRANIL 176
(urethane prepolymer)

Constituents: 25% solids in ethyl acetate, acetone. Characteristics: light straw colored liquid. Outstanding features: when used in urethane adhesives, provides powerful bonding of urethanes or other plastics to each other or to many other products; adhesive is soft, resistant to drycleaning solvents and soap-and-water washing. Suggested uses: base resin for two-component urethane adhesives that when mixed with Mondur CB-75, form a versatile adhesive. Availability: commercial quantities. Mobay Chemical Co.

MULTRON R-26
(polyester resin)

Sp. G., 1.19 at 77 F. Characteristics: viscous, colorless liquid. Suggested uses: in the manufacture and formulation of urethane coatings and adhesives, potting & encapsulating compounds. Availability: commercial quantities. Mobay Chemical Co.

MULTRON R-38
(polyester resin)

Characteristics: pale yellow powder. Solubility: soluble in cresylic acid. Chemical properties: high temperature resistant resin; high chemical and solvent resistance. Suggested uses: in high temperature resistant urethane wire enamel, high chemical and solvent resistant urethane surface coatings. Availability: commercial quantities. Mobay Chemical Co.

NEOTOL
(higher alkyl dimethyl benzyl ammonium chloride)

Constituents: 50% aqueous solution. Characteristics: pale yellow, mobile liquid, faint odor. Solubility: water soluble. Chemical properties: a quaternary ammonium germicide having a phenol coefficient, on the 100% basis, against *staph. aurius* of 370 and against *e. typhi* of 250; hard-water stability, by Chambers' method, of greater than 800 ppm. Suggested uses: in germicidal and sanitizing formulations. Availability: commercial quantities. Fine Organics, Inc.

NIAX® TRIOL LHT-SERIES

Outstanding features: adducts of propylene oxide and 1,2,6-hexanetriol of various molecular weights; LHT-42: 4,000 M.W., LHT-67: 2,500 M.W., LHT-112: 1,500 M.W., LHT-240: 700 M.W.; designed for use as new starting molecules by the urethane polymer industry; for flexible, rigid, or semirigid urethane foams when reacted with toluene diisocyanate and foamed with suitable catalysts; the degree of flexibility in the final foam decreases as the molecular weight decreases. Suggested uses: for the urethane polymers when used in combination with NIAX diol PPG-2025 or alone, their branched structures result in improved compression-deflection curves, lower compression-set characteristics and better resiliency in foams; chemical intermediates for high molecular weight alkyd resins, and low molecular weight plasticizers. Availability: commercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

NICKEL SILICOFLUORIDE

$NiSiF_6 \cdot 6H_2O$; M. W., 308.85; Purity: electronic grades. Characteristics: green crystals. Solubility: soluble in water. Suggested uses: for microwave studies. Availability: experimental quantities. City Chemical Corp.

3,3', 3''-NITRILOTRISPROPIONAMIDE

$N(CH_2CH_2CONH_2)_3$; M. W., 230; M. P., 191-194 C; Purity: 98+%. Characteristics: white crystalline solid. Solubility: soluble in water, glacial acetic acid; insoluble in most common organic solvents. Suggested uses: as a modifier in melamine-formaldehyde resins; polyacerization initiator. Availability: semicommercial quantities American Cyanamid Co., New Product Development Dept.

p-NITROBENZOIC ACID

$NO_2C_6H_4COOH$; M. W., 167.12; M. P., 242 C; Purity: 99.5%; B. P., sublimes. Characteristics: odorless pale yellow crystals. Solubility: slightly soluble in cold water, alcohol, benzene; soluble in acetic acid and alkaline solutions. Chemical properties: nitro substilated aromatic carboxylic acid. Suggested uses: as a chemical intermediate. Availability: semicommercial quantities. Cowles Chemical Co., Organic Chemical Dept.

NONANOIC ACID
(2-propyl-4-methyl pentanoic acid)

M. W., 158; Sp. G., 0.8963 at 20/20 C; Purity, 99%; B. P., 230-237 C at 738 mm. Characteristics: colorless liquid. Solubility: 0.09 parts per 100 in water at 25 C. Suggested uses: readily reacted with primary alcohols for use in plasticizer field; also for use in the paint drier and vinyl stabilizer fields. Availability: semicommercial quantities. Eastman Chemical Products, Inc., Chemical Sales Development Laboratories.

t-NONYLAMINE

$t\text{-}C_9H_{19}NH_2$ and $t\text{-}C_{10}H_{21}NH_2$; M. W., principally 143-157; Sp. G., 0.789 at 25 C; B. P., 5-95% at 160-174 C (760 mm.); Solubility: insoluble in water but soluble in common organic solvents; excellent solubility in petroleum hydrocarbons. Chemical properties: undergoes reactions common to the normal primary amines, but it is unusually stable to oxidation. Suggested uses: as a chemical intermediate for rubber chemicals, insecticides, bactericides, oil additives, photographic chemicals, pharmaceuticals, surface-active agents, corrosion inhibitors, and dyestuffs. Availability: commercial quantities. Rohm & Haas Co., Special Products Division.

NU-MET®

Constituents: moderately alkaline chlorinated detergent suitable for manual use. Characteristics: uniform white granular mixture. Suggested uses: cleaning of stainless steel equipment on dairy farms; especially effective for removing cold milk soil. Availability: commercial quantities. Diamond Alkali Co., Silicate-Detergent-Calcium Division.

n-OCTYL TOSYLATE
(n-octyl p-toluenesulfonate)

M. W., 284; Purity: over 93%. Characteristics: mobile, pale yellow liquid, slight odor. Solubility: insoluble in water, soluble in most common organic solvents. Chemical properties: takes part readily in most substitution reactions to introduce the n-octyl group. Suggested uses: as an intermediate for the introduction of the n-octyl group under mild conditions. Availability: commercial quantities. Fine Organics, Inc.

ORIOL RED CP-1300
(Azo pigment)

Sp. G., 1.59; Purity: commercial. Characteristics: bright red powder; no odor. Solubility: resistant to bleed in naphtha, toluene, alcohol, lacquer solvents, dibutyl phthalate, water, and paraffin. Chemical properties: noteworthy because of its unique, very bright, yellowish-red hue; good opacity or hiding power. Suggested uses: as a colorant for plastics, printing inks, paints, etc. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color and Chemical Division.

OS-59
(alkyl silicate ester)

Sp. G., 0.880 at 25 C; M. P., below —65 C; B. P., over 370 C at 760 mm. Characteristics: clear, essentially colorless liquid. Chemical properties: wide fluid range (—80 F to 700 F) and thermally stable for prolonged periods at 550 F. Suggested uses: as a heat transfer fluid for electronic devices; high-temperature dielectric. Availability: semicommercial quantities. Monsanto Chemical Co., Organic Division.

OXO-DECYL TOSYLATE
(isodecyl p-toluenesulfonate)

M. W., 308; Purity, over 93%. Characteristics: mobile, pale yellow liquid, slight odor. Chemical properties: decyl group identical with the highly branched primary decyl group found in iso-decyl alcohol made by the "Oxo" process; takes part readily in most substitution reactions to introduce a branched chain decyl group. Suggested uses: as an intermediate for the introduction of the branched chain decyl group. Availability: commercial quantities. Fine Organics, Inc.

OXO-HEXADECYL TOSYLATE
(isohexadecyl p-toluenesulfonate)

M. W., 392; Purity, over 93%. Characteristics: mobile, pale yellow liquid, slight odor. Chemical properties: the hexadecyl group in this material is identical with the highly branched primary hexadecyl group found in iso-hexadecyl alcohol made by the "Oxo" process; takes part readily in most substitution reactions to introduce a branched chain hexadecyl group. Suggested uses: as an intermediate for the introduction of the branched chain hexadecyl group. Availability: semicommercial quantities. Fine Organics, Inc.

OXO-OCTYL TOSYLATE
(isooctyl p-toluenesulfonate)

M. W., 284; Purity, over 93%. Characteristics: mobile, pale yellow liquid, slight odor. Solubility: insoluble in water, soluble in most common organic solvents. Chemical properties: the octyl group in this material is identical with the highly branched primary octyl group found in iso-octyl alcohol made by the "Oxo" process; takes part readily in most substitution reactions to introduce a branched chain octyl group. Suggested uses: as an intermediate for the introduction of the branched chain octyl group. Availability: commercial quantities. Fine Organics, Inc.

"OXO"-TRIDECYL TOSYLATE
(isotridecyl p-toluenesulfonate)

M. W., 350; Purity: over 93%. Characteristics: mobile, pale yellow liquid, slight odor. Chemical properties: the tridecyl group in this material is identical with the highly branched primary

*Registered trademark.

tridecyl group found in iso-tridecyl alcohol made by the "Oxo" process; takes part readily in most substitution reactions to introduce a branched chain tridecyl group. Suggested uses: as an intermediate for the introduction of the branched chain tridecyl group. Availability: commercial quantities. Fine Organics, Inc.

PECTINOL 5-B
(pectinolytic enzyme)

Chemical properties: the useful temperature range is up to 120 F; the useful pH range is 2.5-6.0. Suggested uses: for apple juice clarification. Availability: commercial quantities. Rohm & Haas Co., Special Products Division.

PELLETIZED FF ROSIN

Constituents: contains acid and nonacids and an inert conditioner. M. W., 302; Sp. G., 1.05 at 20 C; M. P., 71 C; Purity: approximately 85%; B. P., 200 C. Characteristics: resinous. Outstanding features: saves time and labor, due to pelletization. Suggested uses: as a plasticizer-tackifier for rubber. Availability: commercial quantities. National Rosin Oil Products, Inc., sales agents for G. & A. Laboratories, Inc.

PENNSALT AQUET

Suggested uses: a powdered material for use in maintaining proper pH in swimming pool water for protection of equipment and comfort of bathers. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, B-K Dept.

PENNSALT CLEANER A-28

Suggested uses: an improved soak tank cleaner for aluminum, nonetching and extra free rinsing. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, Metal Processing Dept.

PENNSALT CLEANER EC-25

Suggested uses: an improved emulsion cleaner featuring high flash and stability in hard water. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, Metal Processing Dept.

PENNSALT CLEANER K-11

Suggested uses: a new electrocleaner designed specifically to eliminate streaking of work when slow transfer times are encountered. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, Metal Processing Dept.

PENNSALT CLEANER RR-2

Suggested uses: a noncorrosive acid car cleaner for railroads that protects the metal without causing corrosion. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, Metal Processing Dept.

PENNSALT DARI-KLEEN

Suggested uses: an acid cleaner and milkstone remover for dairy equipment and utensils. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, B-K Dept.

PENNSALT DRAWCOTE 1030

Suggested uses: an improved drawing compound remaining fluid at room temperature, thus reducing maintenance costs and operating difficulties. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, Metal Processing Dept.

PENNSALT DRAWING OIL #6

Suggested uses: a drawing oil for use on aluminum and stainless steel, permitting an improved drawing operation. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, Metal Processing Dept.

PENNSALT PENNSAN

Suggested uses: an improved acid sanitizer and cleaner applied by brush, spray or circulation to all dairy and food plant equipment. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, B-K Dept.

PENNSALT PENN-SIZE

Suggested uses: a sizing compound and fabric conditioner for use by the dry-cleaning industry either in the wheel or as a separate treatment. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, Laundry & Dry Cleaning Dept.

PENNSALT POOL-CLOR

Suggested uses: a 70% chlorine-bearing granular bactericide and sanitizing agent for swimming pool water protection. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, B-K Dept.

PENNSALT SURE-FLOC

Suggested uses: a coagulant and filter aid for maintenance of clear sparkling swimming pool water. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, B-K Dept.

PENTACHLOROETHANE

$CHCl_2CCl_3$; M. W., 202.31; Sp. G., 1.66-1.68; Purity, 96-98%; B. P., 159-163 C. Characteristics: dense colorless to pale straw colored liquid with chloroform-like odor. Solubility: insoluble in water, miscible with most organic liquids. Suggested uses: as a gauge fluid and as a solvent for organic materials; also for the separation of minerals. Availability: semicommercial quantities. Eastern Chemical Corp., Development Dept.

iso-PENTALDEHYDE

C_4H_9CHO; M. W., 86.14; Sp. G., 0.8089 at 20/20 C; B. P., 103.3 C (at 760 mm.). Characteristics: water-white color; sharp odor. Solubility: in water, 0.85% by weight at 20 C; solubility of water in, 2.2% by weight at 20 C. Chemical properties: a mixture of 5-carbon aldehydes consisting of valeraldehyde, 2-methyl butyraldehyde, 3-methyl butyraldehyde; undergoes characteristic reactions of aldehydes. Suggested uses: in the preparation of oil-soluble resins by condensation with phenols; rubber accelerators by condensation with amines; synthesis of amyl amines. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

iso-PENTANOIC ACID

C_4H_9COOH; M. W., 102.14; Sp. G., 0.9388 at 20/20 C; distillation range: 179-187 C (at 760 mm.). Characteristics: water-white color; penetrating odor. Chemical properties: a mixture of 5-carbon acids consisting of approximately 55-65% 1-valeric acid, 35-45% 2-methylbutyric acid and less than 5% 3-methyl butyric acid; undergoes reactions typical of organic acids. Suggested uses: as an intermediate for plasticizers, pharmaceuticals, metallic salts, vinyl stabilizers; extraction of mercaptans from hydrocarbons. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

1-PENTANOL

$C_4H_9CH_2OH$; M. W., 88.15; Sp. G., 0.8144 at 20/20 C; B. P., 138 C (at 760 mm.). Characteristics: water-white in color; mildly fruity odor. Solubility: in water, 2.7% by weight at 22 C. Chemical properties: undergoes reactions typical of normal alcohols. Suggested uses: as an intermediate for pharmaceuticals, plasticizers, synthetic lubricants, mining chemicals, corrosion inhibitors, wetting agents. Availability: commercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

PERCHLORYL FLUORIDE

ClO_3F; M. W., 102.5; Sp. G., (liquid at 20 C) 1.434 g./cc.; M. P., —146±2 C; Purity, 98 wt % min.; B. P., —46.8 C. Characteristics: colorless gas, shipped as a liquid under pressure, non-corrosive to metals when dry at 25 C 760 mm. Solubility: 0.6 g./l. in water; 2.5 to 6 g./l. in such materials as ethanol, ethyl acetate, acetic acid, dioxane, nitrobenzene, chloroform, dimethylformamide. Chemical properties: safely storable in liquid form; strong oxidizing agent; may be controlled; fluorinates active hydrogen; forms perchloryl compounds. Suggested uses: as a dielectric medium; oxidizer in flame photometry; oxidation of vegetable oils and waxes; fluorination and perchlorylation agent; cutting and welding gas; metal processing, bleaching. Availability: semicommercial quantities. Pennsalt Chemicals Corp., Technical Division, Commercial Development Dept.

PETRONAUBA "H" WAX

Constituents: an emulsifiable wax made by oxidizing a selected fraction of Fischer-Tropsch synthesized wax; acid no. 15-25; saponification no. 50-60; penetration 100/5 at 77 F 1-3; melting point 195 F min. Chemical properties: great ease of emulsification, brilliant gloss, unique hardness, and high compatibility. Suggested uses: to produce excellent rebuffable "dry bright" polishes. Availability: commercial quantities. Petrolite Corp., Bareco Wax Co. Division.

PHENYL CARBAMATE

$C_6H_5OCONH_2$; M. W., 137; M. P., 148-150 C; Purity, 99.5. Solubility: insoluble in water, hexane, benzene and carbon tetrachloride; soluble in ethanol. Suggested uses: as a chemical intermediate; solvent possibilities. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

PHENYL CHLOROFORMATE

C_6H_5OCOCl; M. W., 156.5; Sp. G., 1.2390 at 20/20 C; Purity, 97.9; B. P., 192 C (95%). Characteristics: water-white liquid. Solubility: reacts with water; soluble in benzene, hexane and carbon tetrachloride; reacts with ethanol. Suggested uses: as a reactive intermediate, particularly in reactions with active hydrogen compounds. Availability: experimental quantities. Food Machinery and Chemical Corp., Organic Chemicals Division.

3-PHENYL 4-KETOBENZTRIAZINE
(3-phenyl 4-keto 3,4-dihydro 1,2,3 benztriazine)

$C_{13}H_9ON_3$; M. W., 223; M. P., 153-155 C; Purity, 98%. Characteristics: long white needles. Solubility: soluble in methanol; slightly soluble in benzene and ether. Suggested uses: as a chemical intermediate. Availability: experimental quantities. Maumee Chemical Co.

PHOSPHOROUS HEPTASULFIDE

P_4S_7; M. W., 348.4; Sp. G., 2.19 at 17 C; M. P., 305-310 C; B. P., 523 C. Characteristics: light yellow solid. Solubility: 0.029 g./100 g. of CS_2 at 17 C. Chemical properties: readily decomposes in cold water; decomposes in air. Suggested uses: in the preparation of lubricant additives; as an intermediate in organic synthesis. Availability: experimental quantities. Victor Chemical Works, Special Products Division.

PHYTIC ACID
(hexahydroxycyclohexane hexaphosphoric acid)

$C_6H_6[OPO(OH)_2]_6$; M. W., 660.060; Sp. G., 1.58; Characteristics: available in 70% aqueous solution; colorless to pale yellow; odorless to faint caramel odor. Solubility: soluble in water and alcohol in all proportions. Chemical properties: chemical properties are generally similar to those of phosphoric acids. Suggested uses: as a sequestrant for heavy metals; rust inhibitor; in treatment of metal surfaces; additive for paints and coatings; starting material for other compounds. Availability: semicommercial quantities. A. E. Staley Manufacturing Co., Chemical Division.

PICCO 145 PI
(indene copolymer)

Sp. G., 1.05-1.07; M. P., 150-160 C. Characteristics: hard resin. Solubility: soluble at 30% solids in low odor kerosene or other low KB solvents. Chemical properties: excellent solvent release; outstanding solution viscosities at various levels in kerosene, ink oil, and normal heptane; easily emulsified; slight acid number imparts good pigment wetting characteristics; compatible with drying oils; high melting point and excellent solubility. Suggested uses: in printing inks, floor wax, flushing colors, varnishes. Availability: commercial quantities. Pennsylvania Industrial Chemical Corp.

PICCOFLEX 100 and PICCOFLEX 115
(styrene copolymer)

Characteristics: hard resins. Solubility: soluble in toluol, xylol, MEK, MIBK, and 9 toluol: 1 MEK. Chemical properties: chemically neutral; high molecular weight; resistant to kerosene, gasoline, mineral and vegetable oils, water, acids, and alkalies; tough but flexible; excellent color stability; exhibits remarkable pigment wetting and provides improved coating applications. Suggested uses: in water-resistant lacquers and deck paints, concrete masonry coatings, paper coatings, impregnants; for hot melts, molded compositions, tile and decorative coverings, laminants and vapor barriers, wire coatings and insulations, ink vehicles. Availability: commercial quantities. Pennsylvania Industrial Chemical Corp.

PICCOLYTE 115-L
(polyterpene)

M. P., 115 C. Characteristics: hard, brilliant resin. Gardner color 1-3. Solubility: completely soluble in aliphatic hydrocarbons. Chemical properties: nearly water-white in color, nonyellowing, soluble, and compatible with many resins and rubbers. Suggested uses: in pressure sensitive adhesives, paints and enamels, sizing, textile coatings, paper coatings, caulking compounds, back-filling of fabrics, polishes, leather coatings, and specialty printing inks. Availability: commercial quantities. Pennsylvania Industrial Chemical Corp.

PICCOPALE C-1 EMULSION
(polydiene resin emulsion)

Constituents: cationic emulsion of petroleum resin. Solubility: miscible with many cationic rubber and resin latexes; 50% solids. Chemical properties: fine particle size and excellent water resistance. Availability: commercial quantities. Pennsylvania Industrial Chemical Corp.

PIPERAZINE (FLAKE)

$HNCH_2CH_2NHCH_2CH_2$; M. W., 86.14; M. P., 108 C; Purity: 98% minimum; B. P., 145 C (at 760 mm.). Characteristics: white, free-flowing, crystalline solid. Solubility: in water, 15% by weight at 20 C. Suggested uses: as an

NEW CHEMICALS FOR INDUSTRY

intermediate for the manufacture of anthelmintics, tranquilizing drugs, motion sickness drugs, antihistamines, synthetic resins, rubber chemicals, dyestuffs, surfactants and corrosion inhibitors. Availability: commercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

PIPERYLENE
(pentadiene-1,3)

C_5H_8; Constituents: mixed isomers (cis and trans pentadiene-1,3); M. W., 68.11; Purity, 83.4-91.8 mol %. Suggested uses: for organic syntheses. Availability: experimental quantities. Phillips Petroleum, Special Products Division.

PLASTICONE RED LIGHT 10465
(pyrazolone red pigment)

Sp. G., 1.46; Purity: commercial. Characteristics: light red shade powder with bluish red tint; no odor. Solubility: resistant to bleed in water, organic solvents and plasticizers. Chemical properties unique because it has a bright light shade with good opacity; the lightest, brightest and most opaque of the pyrazolone reds; very stable to heat. Suggested uses: as a coloring agent for paints, printing inks, plastics and rubber. Availability: commercial quantities. The Sherwin-Williams Co., Pigment, Color and Chemical Division.

PLIOLITE LATEX 151
(styrene-butadiene latex)

Characteristics: aqueous dispersion of a reinforcing type styrene-butadiene copolymer. Chemical properties: reinforces rubber latices without effecting tensile and elongation. Suggested uses: as a modifier and reinforcing agent for natural, SNR (GRS), nitrile and neoprene latex. Availability: commercial quantities. The Goodyear Tire & Rubber Co., Chemical Division.

PLIOLITE VT
(copolymer resin)

Characteristics: white friable granules. Solubility: soluble in aromatic and aliphatic solvents with a KB value of 35 or higher. Suggested uses: in traffic paints, paper coating, adhesives, printing inks and abrasion resistant coatings. Availability: commercial quantities. The Goodyear Tire & Rubber Co., Chemical Division.

PLIOVIC S50
(polyvinyl chloride resin)

Inherent viscosity, 0.68; Sp. G., 1.40. Characteristics: fine white powder. Chemical properties: superior plastic flow properties processes between 250-300 F; processes easily without plasticizers; equivalent in heat stability to higher molecular weight resins under normal operating cycles. Suggested uses: for injection molding, rigid extrusions and moldings, blends with higher molecular weight resins, vinyl asbestos flooring, semirigid calendered goods, high-fidelity phonograph records and nitrile rubber combinations. Availability: commercial quantities. The Goodyear Tire & Rubber Co., Chemical Division.

PLIOVIC S70
(polyvinyl chloride resin)

Inherent viscosity, 0.86; Sp. G., 1.40. Characteristics fine white powder. Chemical properties: processing temperatures of 300-320 F; compounds have fast and homogenous fluxing, smooth rolling calender banks, and high physical properties at reduced plasticizer levels. Suggested uses: for calendered clear and opaque sheeting and film, injection molding, high chemical resistant rigids, extruded cove base molding. Availability: commercial quantities. The Goodyear Tire & Rubber Co., Chemical Division.

PLIOVIC VO
(polyvinyl chloride resin)

Inherent viscosity, 1.2; Sp. G., 1.40. Characteristics: fine white powder. Chemical properties: dispersion resin for plastisols and organsols exhibiting low viscosity, good shelf life, superior electrical properties and low water absorption; finished products have a smooth, dry surface. Suggested uses: for electrical insulation, rotational molding of toys and rigid products, metal coatings, dip coatings for gloves, dish drainers, tool handles, etc. Availability: commercial quantities. The Goodyear Tire & Rubber Co., Chemical Division.

POLYGLYCOLS 11-80, 11-100, 11-200, 11-300, 11-400
(polypropylene glycol triglycerol ethers)

$C_3H_5(C_3H_6O)_3H$; M. W., 650-5100; Chemical properties: trihydroxy materials. Suggested uses: for polyurethane intermediates; plasticizers for nitrocellulose. Availability: semicommercial quantities. Dow Chemical Co., Technical Service and Development Division.

POLYOX® WATER-SOLUBLE RESIN WSR-35

M.P. white resin, in granular form has a melting point of 65-67C. Chemical properties: extremely high-molecular-weight-polymer of ethylene oxide. Suggested uses: for paper coatings, detergent binders and adhesive applications. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

POLYOX® WATER-SOLUBLE RESIN WSR-205

M.P. white resin in granular form has a melting point of 65-67C. Chemical properties: extremely high-molecular-weight-polymer of ethylene oxide. Suggested uses: as a thermoplastic processing resin for manufacture of water-soluble films. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemical Co. Division.

POLYOX® WATER-SOLUBLE RESIN WSR-301

M.P. white resin in granular form has a melting point of 65-67C. Chemical properties: extremely high-molecular-weight-polymer of ethylene oxide. Suggested uses: as a general thickener, detergent stabilizer, film former in aerosols, stabilizer in tooth pastes. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

POLYOX® WATER-SOLUBLE RESIN WSR-701

M.P. white resin, in granular form, has a melting point of 65-67C. Chemical properties: extremely high-molecular-weight-polymer of ethylene oxide. Suggested uses: as a coagulant grade resin. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

POLYOX® WATER-SOLUBLE RESIN, TEXTILE WARP SIZE GRADE

M.P. white resin in granular form has a melting point of 65-67C. Chemical properties: extremely high-molecular-weight-polymer of ethylene oxide. Suggested uses: for warp size evaluation. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

POTASSIUM CHROMICYANIDE

$K_3Cr(Cn)_6$; M.W. 325.41. Characteristics yellow powder. Solubility: soluble in cold water and potassium cyanide solutions; decomposed by hot water. Suggested uses: microwave studies; special grade available for electronic use. Availability: experimental quantities. City Chemical Corp.

POTASSIUM COBALTICYANIDE

$K_3Co(Cn)_6$ M.W. 332.34; Characteristics: pale yellow crystals. Solubility: soluble in water. Suggested uses: microwave studies; pure and electronic grades available. Availability: semicommercial quantities. City Chemical Corp.

POTASSIUM MANGANICYANIDE

$K_3Mn(Cn)6$; M.W. 328.33; Characteristics: red crystals. Solubility: soluble in water. Suggested uses: for microwave studies. Availability: semicommercial quantities. City Chemical Corp.

PROPYL AMINE

$CH_3CH_2CH_2NH_2$; M.W. 59.11; Sp.G. 0.7182 at 20/20C; B.P. 48.5C (at 760 mm.); 12C (at 50 mm.); —37C (at 10 mm.). Solubility: completely soluble in water, ethyl ether and methanol at 25C. Chemical properties: undergoes reactions typical of primary amines. Suggested uses: in the preparation of corrosion inhibitors, emulsifiers, dyestuffs, rubber chemicals, petroleum specialties, insecticides, textile finishing agents and pharmaceuticals. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

PVS BEADS EXP. NO. 1085-108
(polyvinyl stearate beads)

$(-CH_2-CH-)_x$ $OCOC_{17}H_{35}$; M.P. 47-48C. Characteristics: faint, pleasant odor, white powder. Solubility: soluble in benzene, carbon tetrachloride, kerosene, mineral spirits, petroleum ether, Stoddard solvent, various waxes. Chemical properties: wax-like polymer; hard, with low melting point; low viscosity; sharp melting point and narrow softening range. Suggested uses: in polishes, coatings, textile finishes. Availability: semicommercial quantities. Air Reduction Co., Inc., Colton Chemical Co. Division.

PYROCIDE 175 RC

Constituents: mixture of pyrethrins I, pyrethrins II, cinerin I and cinerin II with solvents. Sp.G. approximately 0.848; Purity: 20%. Characteristics: light amber color, liquid, floral odor. Solubility: soluble in deoderized kerosene, aromatic petroleum derivatives, common organic solvents, and florinated hydrocarbon propellents. Chemical properties: lack of typical pyrethrin stain, characteristic fast knockdown and kill of insects with low toxicity to warm-blooded animals. Suggested uses: in insecticidal aerosols, oil sprays, emulsifiable concentrates, and dusts for control of insects in agriculture and industry. Availability: commercial quantities. McLaughlin Gormley King Co., Chemical Division.

PYRROLIDINE

C_4H_9N; M.W. 71.12; Purity 95% minimum; B.P. 86-87C at 760 mm. Characteristics: colorless to pale yellow liquid. Chemical properties: undergoes reactions typical of secondary amines. Suggested uses: as an intermediate in the preparation of rubber accelerators, insecticides and pharmaceuticals. Availability: commercial quantities. Ansul Chemical Co., Chemical Division.

QUADRAMUL
(polyethylene emulsions)

Sp. G. 0.985; Purity: 30% solids. Characteristics: slight waxy odor, amber to white fluid emulsion. Solubility: dispersible in cold water. Chemical properties: imparts a durable body to fabric, enhances water repellency. Suggested uses: sizing, finishing agent, water repellent, modifier for U-F and M-F resins. Availability: semicommercial quantities. Rumford Chemical Works, Division of Hulman & Co.

QUADRASOFT E

Constituents: nonionic emulsion of polyethylene waxes. Sp. G. 1.02. Characteristics: pure white pasty cream with a pleasing odor. Solubility: disperses readily in cold water. Chemical properties: stable to magnesium chloride catalysts when used in all types of resin finishes; imparts excellent interfiber lubrication with a soft glove hand. Suggested uses: cottons & rayons to increase flat abrasion and crease recovery when using U-F, M-F and E-U resins; top finishing agent and fiber lubricant. Availability: commercial quantities. Rumford Chemical Works, Division of Hulman & Co.

QUATROIL
(higher alkyl trimethyl ammonium p-toluenesulfonate)

Constituents: 50% solution in mineral oil. Characteristics: pale yellow, mobile liquid, slight odor of mineral oil. Solubility: soluble in mineral oil and related compounds. Chemical properties: a quaternary ammonium fungicide of high potency which is soluble in oil. Suggested uses: as a fungicide in nonaqueous systems, such as plastics, oil-wells, rubber. Availability: commercial quantities. Fine Organics, Inc.

RHOPLEX® B-5

A soft, aqueous dispersion of an acrylic polymer with excellent chemical and mechanical stability. It is recommended as a pigment dyeing binder, for bonding nonwovens and for use with thermosetting resins on wash-wear cottons. Rohm & Haas Co.

RUBARITE S1-40, S2-40, S3-40

Constituents: 40% rubber polymer, 60% inert separating agent. Characteristics: powder form of mineral rubber polymer. Suggested uses: to improve cold flex as well as increase resistance to cold flow of asphalt and tar compounds; S3-40 is used in coal tar compounds to improve jet fuel resistance as well as above mentioned characteristics; joint and crack filling, storage battery sealers, underbody automotive coating,

*Registered trademark.

roofing compounds, laminating compounds for paper, sewer pipe joint sealing compounds, asphalt tile, metal culvert coatings, tie coatings, highway seal coats as well as hot-mix, aircraft landing strips—especially for jet aircraft. Availability: commercial quantities. Goodyear Tire & Rubber Co., Chemical Division.

SANTOMERSE E LIQUID

Constituents: 30% active sulfonate, 1-2% sodium sulfonate, 68-69% water. M.W. 250 (average). $C_{11}H_{15}SO_3Na$; Characteristics: 30% solution of mild odor, light amber color. Chemical properties: hydrotrobe. Suggested uses: as a coupling or solubilizing agent. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Chemicals Division.

SANTOMERSE SX

Constituents: 30% active sulfonate, less than 0.5% sodium sulfate, remainder—water. M.W. 334 average (active component). $C_{15}H_{27}SO_3Na$; Characteristics: 30% aqueous light amber solution; mild odor. Solubility: soluble in water, alcohol. Chemical properties: wetting agent. Suggested uses: wetting agent, liquid detergent. Availability: commercial quantities. Monsanto Chemical Co., Inorganic Chemicals Division.

SEABOND® TEXTILE PRINTING PIGMENTS

Constituents: dispersible pigment colors. Characteristics: oil-in-water emulsions. Solubility: water dispersible. Chemical properties: give brilliant colors having exceptional fastness to light, crocking, washing and dry cleaning; easy to clean from equipment. Suggested uses: for color printing on textiles. Availability: commercial quantities. Sterling Drug Inc., Hilton-Davis Chemical Co. Division.

SILASTIC® 916

Constituents: uncured silicone rubber, fully compounded. Characteristics: red silicone rubber suitable for molding, extruding or calendering. Chemical Properties: parts fabricated from Silastic 916 have tensile strength in the range of 1500 psi., elongation of about 450%, tear strength of about 180 lbs./inch; useful at temperatures from —130 to over 500 F. Suggested uses: to make heat-stable rubber parts such as oven door gaskets, aircraft door seals, O-rings, and wire and cable insulation. Availability: commercial quantities. Dow Corning Corp.

SILASTIC RTV 501®

Constituents: an unvulcanized rubber stock supplied with a separate catalyst. Characteristics: Silastic RTV 501 is a white fluid of 60,000 centistokes viscosity; the catalyst supplied is a brown fluid. Chemical properties: vulcanizes at room temperature to form a 30-durometer rubber; is serviceable at temperatures from —70 to over 500 F; has good shelf life before catalyzing. Suggested uses: potting or encapsulating electrical and electronic parts; general caulking and sealing. Availability: commercial quantities. Dow Corning Corp.

KONA SUPER SILICA
(silicon dioxide)

SiO_2; M. W., 60.06; Purity: 99.9+%; B. P., 2230 C. Characteristics: bulk density about 90 lbs./cu. ft.; semigranular; milk-white. Chemical properties: maximum Se_2O_3, 0.005%. Uses: in silicate chemistry, special optical glasses, ray-transmitting glasses, fused quartz; synthetic mica, cracking catalyst carrier. Availability: commercial quantities. International Minerals & Chemical Corp., Industrial Minerals Division.

SINCLAIR NO. 110 AROMATIC SOLVENT

Constituents: Aromatics 96.3%; naphthenes 0.6%; paraffins 3.1%. Sp. G. 0.8735. Characteristics: water-white liquid, typical aromatic odor. Chemical properties: high aromatic content solvent. Suggested uses: in automotive enamels, baking and brushing enamels, roller coatings, printing inks, resins, insecticides. Availability: commercial quantities. Sinclair Chemicals, Inc.

α-SODIO SODIUM ACETATE

$Na\text{-}CH_2\text{-}COO\text{-}Na$; M.P. decomposes at 28° C without melting; Purity: 70-85%. Characteristics: free flowing powder. Solubility: insoluble in common organic solvents. Chemical properties: a bi-functional organometallic compound providing both a reactive center and a carboxyl structure; because of the reactivity of the carbon-sodium bond, this versatile compound enters into many varied reactions. Suggested uses: as a low-cost chemical intermediate for pharmaceuticals, plastics, and specialty chemicals. Availability: semicommercial quantities. Ethyl Corp. Business Research Division.

SODIUM DIETHYLDITHIOCARBAMATE

$(C_2H_5)_2NCS_2Na$; M.W. 171.27; Purity: chemically pure. Characteristics: white to off-white crystals. Solubility: soluble in water and alcohol. Suggested uses: as a reagent for the colorimetric determination of small amounts of copper; as an antioxidant. Availability: pilot plant quantities. Eastern Chemical Corp., Development Dept.

SODIUM ETHYL SULFATE

$C_2H_5OSO_3Na$; M.W. 148; Characteristics: white crystals. Solubility: soluble in water. Suggested uses: for microwave studies. Availability: experimental quantities. City Chemical Corp.

SOLVO

Constituents: an oil-soluble and water-dispersible reagent having both solvent and detergent properties, free of organic chlorides. Characteristics: high flash point, low vapor pressures; liquid, amber color. Solubility: oil soluble, water dispersible. Chemical properties: chloride-free; precludes the possibility of contaminating crude oil with organic chlorides in refineries where chlorides are highly undesirable. Suggested uses: to remove paraffin deposits in tubing, flow lines, and tanks of oil producing systems. Availability: commercial quantities. Petrolite Corp., Tretolite Co. Division.

SPRING BREEZE

Suggested uses: an aerosol air refresher and room deodorizer. Availability: commercial quantities. Pennsalt Chemicals Corp., Chemical Specialties Division, Household Products Dept.

STA-MINO AMINO ACIDS

Constituents: mixtures of amino acids containing l-leucine, l-isoleucine, l-methionine, l-phenylalanine, and l-tyrosine. Purity: available in different degrees of purity. Characteristics: powder form; refined grade is white in color and of high purity. Suggested uses: as fermentation nutrients; amino acid supplementation of foods and feeds; starting material for individual amino acids and derivatives; in pharmaceutical preparations; as a brightener in electroplating. Availability: semicommercial quantities. A. E. Staley Manufacturing Co., Chemical Division.

STEARYL TOSYLATE
(n-octadecyl para-toluensulfonate)

M.W. 420; M.P. 45 C min.; Purity: over 93% as ester. Characteristics: white, free flowing, crystalline. Chemical properties: takes part in most substitution reactions to introduce the n-octadecyl group. Suggested uses: as an intermediate for the introduction of the stearyl group. Availability: commercial quantities. Fine Organics, Inc.

SUCRODET D-600

Constituents: a purified sucrose dipalmitate. Purity: saponification #136.8-137.7. Characteristics: white to pale ivory, freeflowing fine powder without taste or odor. Solubility: soluble in alcohols, ketones, chlorinated aliphatic hydrocarbons; soluble hot above its softening point in: vegetable oils, mineral oils (on cooling, solutions becomes viscous and gels), paraffin, and propylene glycol; dispersible in hot water. Chemical properties: emulsifier and surfactant without taste or odor. Suggested uses: as an emulsifier in pharmaceuticals, cosmetics and foodstuffs. Availability: semicommercial quantities. Millmaster Chemical Corp.

SURFYNOL 104A
(dltertiary acetylenic glycol)

Constituents: 50% solution in 2-ethyl hexanol; M.P. below —40 C. Characteristics: colorless liquid; octyl alcohol odor. Outstanding features: a surface-active product as well as a defoamer. Suggested uses: as a defoamer for aqueous systems, emulsion paints, paper coatings, during latex production, insecticide formulations, low-foam detergents. Availability: semicommercial quantities. Air Reduction Chemical Co.

SUSPENSOIL®

Constituents: highly silicated commercial laundry detergent. Characteristics: rapidly soluble dustless powder; outstanding wetting, dispersive, and detersive properties. Suggested uses: for family laundries, linen supply plants, hospital laundries, industrial laundering. Availability: commercial quantities. Diamond Alkali Co., Silicate-Detergent-Calcium Division.

SYL-KEM 21
(pentamethyldisiloxanemethyl methacrylate)

$(CH_3)_3SiOSi(CH_3)_2CH_2OOCC\ \ CH_3(CH_3)\text{-}CH_2$; B.P. 86.5 C. Characteristics: clear liquid. Solubility: soluble in hydrocarbons, ethers, alcohols, methyl methacrylate, styrene, acrylonitrile. Chemical properties: preliminary work indicates that product will undergo many of the reactions typical of methyl methacrylate; easily polymerized or copolymerized with methyl methacrylate, styrene, and acrylonitrile; copolymers with methacr late result in polymers with very low coefficients of friction with steel surfaces. Suggested uses: may permit synthesis of new polymers with novel bonding properties, unusual surface characteristics, or a high degree of internal plasticization. Availability: semicommercial quantities. Dow Corning Corp.

SYL-MER® 72

Constituents: water based emulsion; 30% silicone. Characteristics: milk-white liquid. Solubility; easily dispersible in water. Chemical properties: can be easily applied to natural and synthetic fibers and fiber blends at relatively low cure temperatures. Suggested uses: as a fabric finish; gives durable water repellency; spot and stain resistance to water-borne substances; full, luxurious hand; and improved physical properties. Availability: commercial quantities. Dow Corning Corp.

SYNAD 45

Characteristics: light colored liquid. Solubility: completely soluble in all fatty and petroleum oils. Chemical properties; pour point, —80 F, viscosity index, 150, exceptional lubricity. Suggested uses: as a low-temperature synthetic lubricant, boundary lubrication additive. Availability: commercial quantities. Carlisle Chemical Works, Inc.

SYNAD 325

Characteristics: light colored liquid. Solubility: completely soluble in all fatty and petroleum oils. Chemical properties: Pour Point, —65 F; viscosity index, 140; exceptional lubricity. Suggested uses: low-temperature synthetic lubricant; boundary lubrication additive. Availability: commercial quantities. Carlisle Chemical Works, Inc.

TABULAR ALUMINA BALLS T-162

Al_2O_3; M. W., 102; Sp. G., 3.9-4.0; M. P., 2040 C; Purity, 99.5%+. Characteristics: smooth, white surfaced, nominal ⅛" diameter balls (previously available in only ¼", ⅜", ½" and ¾"). Solubility: practically insoluble in all aqueous acids and alkaline solutions and only slightly soluble in hydrofluoric acid. Chemical properties: high density, high chemical purity, chemical inertness, high melting point, good thermal conductivity, good thermal and mechanical shock resistance. Suggested uses: inert support and cover for catalyst reactors and desiccant beds; heat reservoir in catalytic reactions. Availability: commercial quantities. Aluminum Company of America, Chemicals Division.

TANFLO®
(polymeric polyphenol blend)

Characteristics: a free-flowing, noncaking powder. Solubility: soluble in water with addition of small amounts of caustic soda. Suggested uses: as a low-cost drilling mud dispersant for use under noncritical drilling conditions. Availability: commercial quantities. Rayonier, Inc., Silvichemical Division.

TEFLON® 41X
(tetrafluoroethylene resin, aqueous dispersion)

Constituents: hydrophobic, negatively charged colloids stabilized by a nonionic wetting agent and dispersed in aqueous media. Chemical properties: at moderate temperatures, resins are completely inert to all chemicals and solvents except alkali metals; under extremes of temperature and pressure, the halogens—especially fluorine—and certain halogenated compounds and solvents can produce physical swelling; equally resistant to solvents such as hydrocarbons, halogenated hydrocarbons, ketones, esters and alcohols. Suggested uses: for impregnation of asbestos and glass fabric for use in gaskets and packing, reinforced powders for molding and extrusion, water-repellent coating for fabrics and paper; coating asbestos and glass fabric for electrical tapes and laminates, coated glass braid, coating baking pans, heat-sealing plates, lamination of coated glass fabric for bearings, oil seals, etc. Availability: experimental quantities. E. I. du Pont de Nemours Co., Inc., Polychemicals Dept.

TEFLON® 100X
(perfluorocarbon resin extrusion powder)

Chemical properties: chemically inert; heat-resistant; excellent dielectric characteristics; tough, strong; essentially no moisture absorption; weather resistant; inert to practically all chemicals and solvents at temperatures up to 400 F; has no known solvent and is affected only by alkalis and certain complex halogenated compounds. Suggested uses: for hose, tubing and bottles; insulation of coaxial cable wire, jacketing for aircraft and industrial wiring and printed circuits; insulation of hook-up wire for radar equipment, computors, radar guidance and telemetering equipment, military and industrial instrumentation; should also find applications in such fields as medicinal, pharmaceutical, bearings, mechanical parts and corrosive and high-

temperature packing. Availability: experimental quantities. E. I. du Pont de Nemours Co., Inc., Polychemicals Dept.

TEREPHTHALOYL CHLORIDE

$C_8H_4O_2Cl_2$; M. W., 203.03; M. P., 84 (pure); Purity, >98%; B. P., 266 C. Characteristics: white crystals having a pungent odor. Solubility: soluble in n-hexane, benzene and carbon tetrachloride. Chemical properties: a difunctional product that reacts as a typical acid chloride to produce esters, amides, salts, etc. Suggested uses: as a difunctional compound, uses should be found in high-molecular-weight polymeric materials, e.g., synthetic films and fibers. Availability: pilot-plant. Hooker Electrochemical Co., Product Development Dept.

TETRAKIS (HYDROXYMETHYL) PHOSPHONIUM CHLORIDE

$(HOCH_2)_4PCl$; M. W., 190.57; M. P., 154 (pure); Purity, 95% min. assay. Characteristics: white to pale yellow crystalline solid. Solubility: extremely soluble in water; soluble in low-molecular-weight alcohols; insoluble in nonpolar solvents. Chemical properties: a phosphorium chloride containing reactive methylol groups. Suggested uses: to produce a permanent flameproof finish for cellulosic materials such as cotton and rayon textiles, and paper. Availability: semicommercial quantities. Hooker Electrochemical Co., Product Development Dept.

TETRACHLOROBISPHENOL A (2,2'-bis[3,5-dichoro-4-hydroxyphenyl] propane)

$C_{15}H_{12}O_2Cl_4$; M. W., 366.08; M. P., 134.8-136.0 C; Purity, high. Characteristics: fine white crystals with mild chlorophenolic odor. Solubility: soluble in benzene, acetic acid, chloroform, ethanol, acetone, ethyl acetate, and ether. Chemical properties: new intermediate for epoxy resins to impart flame retardance and improved high-temperature strength properties. Suggested uses: as an intermediate for epoxy resins, and polyesters. Availability: experimental quantities. Monsanto Chemical Co., Organic Division.

TETRADECYLAMINE

$C_{14}H_{29}NH_2$; M. W., 213; Purity, 95% minimum. Characteristics: white crystals. Solubility: soluble in organic solvents, insoluble in water. Suggested uses: in pharmaceuticals and cosmetics. Availability: commercial quantities. Onyx Oil & Chemical Co., Industrial Division.

3,3'-THIODIPROPIONIC ACID

$S(CH_2CH_2COOH)_2$; M. W., 178.20; M. P., 134 C; Purity, 98%+. Characteristics: white crystalline solid. Solubility: soluble in hot water, acetone, alcohol. Chemical properties: undergoes reactions of a dibasic acid; also reacts with ammonia; may be oxidized; undergoes condensation reactions. Suggested uses: intermediate for plasticizers; antioxidant; approved for use in certain edible fats and oils. Availability: semicommercial quantities. American Cyanamid Co., New Product Development Dept.

μ-TOLUIC ACID

$CH_3C_6H_4COOH$; M. W., 136.14; Sp. G., 1.054 g./m. at 112 C; M. P., 105-107 C; Purity, 97.5%; B. P., 263 C. Characteristics: pale yellow crystals, slight odor. Solubility: very soluble in alcohol and ether; slightly soluble in water; soluble in aqueous alkali. Chemical properties: aromatic carboxylic acid. Suggested uses: as an intermediate for diethyltoluamide. Availability: semicommercial quantities. Cowles Chemical Co., Organic Chemical Dept.

n-HEXYL TOSYLATE (n-hexyl p-toluenesulfonate)

M. W., 256; Purity over 93%. Characteristics: mobile, pale yellow liquid, slight odor. Solubility: insoluble in water, soluble in most common organic solvents. Chemical properties: takes part readily in most substitution reactions to introduce the n-hexyl group. Suggested uses: as an intermediate for the introduction of the n-hexyl group under mild conditions. Availability: commercial quantities. Fine Organics, Inc.

TRIALLYLAMINE (tri [2 propenyl] amine)

$(CH_2{=}CH\text{-}CH_2)_3N$; M. W. 137.22; Sp. G. 0.800 (pure compound); M. P. -70 C; B. P. 149.5 C. Solubility: in water 0.25% by weight; complete in toluene, acetone, octane. Suggested uses: as an intermediate for preparation of quaternary ammonium salts; these salts have been copolymerized to form water soluble cross-linked polymers; other derivatives of potential interest in rubber chemistry and ion exchange resins. Availability: semicommercial quantities. Shell Chemical Corp. Market Development Dept.

3,4,4'-TRICHLOROCARBANILIDE

$C_{13}H_9Cl_3N_2O$; M. W., 315.6; M. P., 250 C; Purity, essentially pure. Characteristics: fine white powder. Solubility: insoluble in water and many organic solvents; 35% soluble in dimethylformamide; 10-25% soluble in polyethylene glycols or monoglycerides. Suggested uses: as a bacteriostat for soap and other skin-care preparations; for trial wherever it is desired to control Gram positive bacteria. Availability: commercial quantities. Monsanto Chemical Co., Organic Chemicals.

TRICHLOROMETHANESULFONYL CHLORIDE

Cl_3CSO_2Cl; M. W., 217.9; M. P., 142 C; Purity: 98+%; B. P., 170 C. Characteristics: white crystalline material with a lachrymatory odor. Solubility: soluble in most organic solvents; insoluble in water. Chemical properties: not easily hydrolyzed by water; chlorines and SO_2 group reactive; condenses with aromatic amines, benzene; adds CCl_3 group to double bond; SO_2 can be reduced, is often eliminated during reaction. Suggested uses: as an intermediate for manufacture of dyestuffs and pharmaceuticals and other synthetic organic chemicals. Availability: experimental quantities. Stauffer Chemical Co., Market Development Dept.

1,3-bis(TRICHLOROMETHYL)BENZENE

$C_8H_4Cl_6$; M. W., 312.86; M. P., 40.04 (pure); Purity, about 90% molar purity. Characteristics: white crystalline material with a pungent odor. Solubility: insoluble in water, soluble in benzene, carbon tetrachloride, methanol and xylene. Chemical properties: hydrolysis to isophthaloyl chloride or the corresponding acid is readily accomplished; the reactive chlorines offer a point of attack. Suggested uses: as a chemical intermediate and in the polymer field. Availability: semicommercial quantities. Hooker Electrochemical Co., Product Development Dept.

1,4-bis(TRICHLOROMETHYL)BENZENE

$C_8H_4Cl_6$; M. W., 312.86; M. P., 110.8 C (pure); Purity, about 92% molar purity; B. P., 182 C (at 11 mm.). Characteristics: white, crystalline product with a pungent odor. Solubility: soluble in carbon tetrachloride, methanol, benzene, and xylene, insoluble in water. Chemical properties: labile chlorine atoms can be readily substituted; easily hydrolyzed to the corresponding acid or acid chloride. Suggested uses: has potential in dyestuffs and synthetic rubbers; because of its reactivity, it should be of interest in the polymer field. Availability: semicommercial quantities Hooker Electrochemical Co., Product Development Dept.

n-TRIDECANE

$C_{13}H_{28}$; M. W., 184.354; Sp. G., 0.75651 at 20/4 C; F. P., —5.583 C; Purity, 99 mol % minimum; B. P., 225.6-227.8 C. Suggested uses: as a laboratory standard, organic syntheses. Availability: experimental quantities. Phillips Petroleum, Special Products Division.

TRIFLUOROACETIC ANHYDRIDE

$(CF_3CO)_2O$; M. W., 210; Purity, 99%; B. P., 40-41 C. Characteristics: colorless, corrosive liquid with pungent odor. Solubility: decomposed by water, soluble in ether. Chemical properties: dehydrating agent. Suggested uses: as a condensing agent in the preparation of esters of fragile acids. Availability: semicommercial quantities. The Matheson Co., Inc., Matheson Coleman & Bell Division.

TRIISOBUTYLENE OXIDE

$C_{12}H_{24}O$; M. W., 184.32; Sp. G., 0.8342 at 20/20 C; M. P., 202.5 C (at 760 mm.) and 113.5 C (at 50 mm.). Solubility: in water, less than 0.01% by weight at 20 C; solubility of water in, 0.15% by weight at 20 C. Chemical properties: epoxy ring can be opened with the usual reactions of epoxides. Suggested uses: as an acid acceptor; chemical intermediate. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co., Division.

TRIISOOCTYLAMINE

$(C_8H_{17})_3N$; M. W., 353.7; Sp. G., 0.8193 at 60/60 F; Purity, 100%; B. P., 348-358 C. Characteristics: practically odorless, colorless liquid. Solubility: soluble in common organic solvents. Suggested uses: in solvent extraction of uranium and rare earths. Availability: experimental quantities. Gulf Oil Corp., Petrochemicals Dept.

TRIS AMINO (tris[hydroxymethyl] aminomethane)

M. W., 121.14; M. P., 171-172 C; B. P., 219-220 C at 10 mm. Characteristics: white crystalline powder. Solubility: soluble in water at 20 C, 80 g./100 ml. Chemical properties: the only tri-hydroxy molecule commercially available having a primary amine group; undergoes a variety of chemical reactions; reacts with fatty acids to form soaps with unusually strong emulsifying powers; relatively high boiling point and low combining weights recommend its use in the preparation of cosmetic creams, textile specialities, cleaning compounds and many other emulsions. Availability: commercial quantities. Commercial Solvents Corp., Industrial Chemicals Dept.

TRIS NITRO (tris[hydroxymethyl] nitromethane)

M. W., 151.12; M. P., 175-176 C; Characteristics: white crystalline solid. Solubility: in water—220 g./100 ml at 20 C; very soluble in alcohols; sparingly soluble in hydrocarbons. Chemical properties: stable in solution; traces of salts of strong bases with weak acids, or alkaline materials in general cause decomposition with slow release of formaldehyde; a convenient formaldehyde donor with easily controlled reaction rate. Suggested uses: as a bactericide in water-oil emulsions, and as a vapor phase disinfectant; should be of value as a microbiological growth inhibitor in industrial water systems, and in the paper and pulp industry. Availability: commercial quantities. Commercial Solvents Corp., Industrial Chemicals Dept.

TRITON® CF-21

A nonionic surfactant specifically recommended for its low-foaming properties, for use as a penetrant in desizing, in continuous boil-off cottons, and as assistant in dyeing of direct, basic and dispersed colors as well as pigment padding. Rohm & Haas Co.

TYRENE® (2,4,6-trichloroanisole)

$C_7H_5OCl_3$; M. W. 211.5; M. P., 57-59 C; Purity, 95%; B. P., 132 C (28 mm.). Characteristics: white crystalline solid; sublimes slowly at room temperature; faint odor similar to that of acetophenone; volatile with steam. Solubility: soluble in methanol, dioxane, benzene, cyclohexanone; insoluble in water. Chemical properties: fairly stable in both acid and alkaline systems. Suggested uses: as a dye assistant for polyester fibers. Availability: semicommercial quantities. Diamond Alkali Co., Central Research Laboratory.

UNION CARBIDE K-1605R FUSIBLE SILICONE RUBBER

Chemical properties: first member of a new series of fusible compounds; fabricated parts have pressure-sensitive surfaces that adhere to themselves, to other silicone rubbers, to metals, or to fabrics. Suggested uses: used as insulating material for wire and cable, as a sealant for electronic or heating equipment, for wrapping motor and generator coils, and in solution form as a coating for fabrics. Availability: commercial quantities. Union Carbide Corp., Silicones Division.

UNION CARBIDE L-45 SILICONE OIL, ELECTRICAL GRADE (dimethyl silicone oil [specially purified])

Sp. G., 0.955-0.975; Purity: specially purified. Characteristics: color—25 (measured by "Hellige Aqua Tester"). Chemical properties: specially dried, packaged, and control tested to insure maximum dielectric strength and volume resistivity. Suggested uses: as an insulating and cooling medium in capacitors, small transformers, circuit breakers, and other electrical devices. Availability: commercial quantities. Union Carbide Corp., Silicones Division.

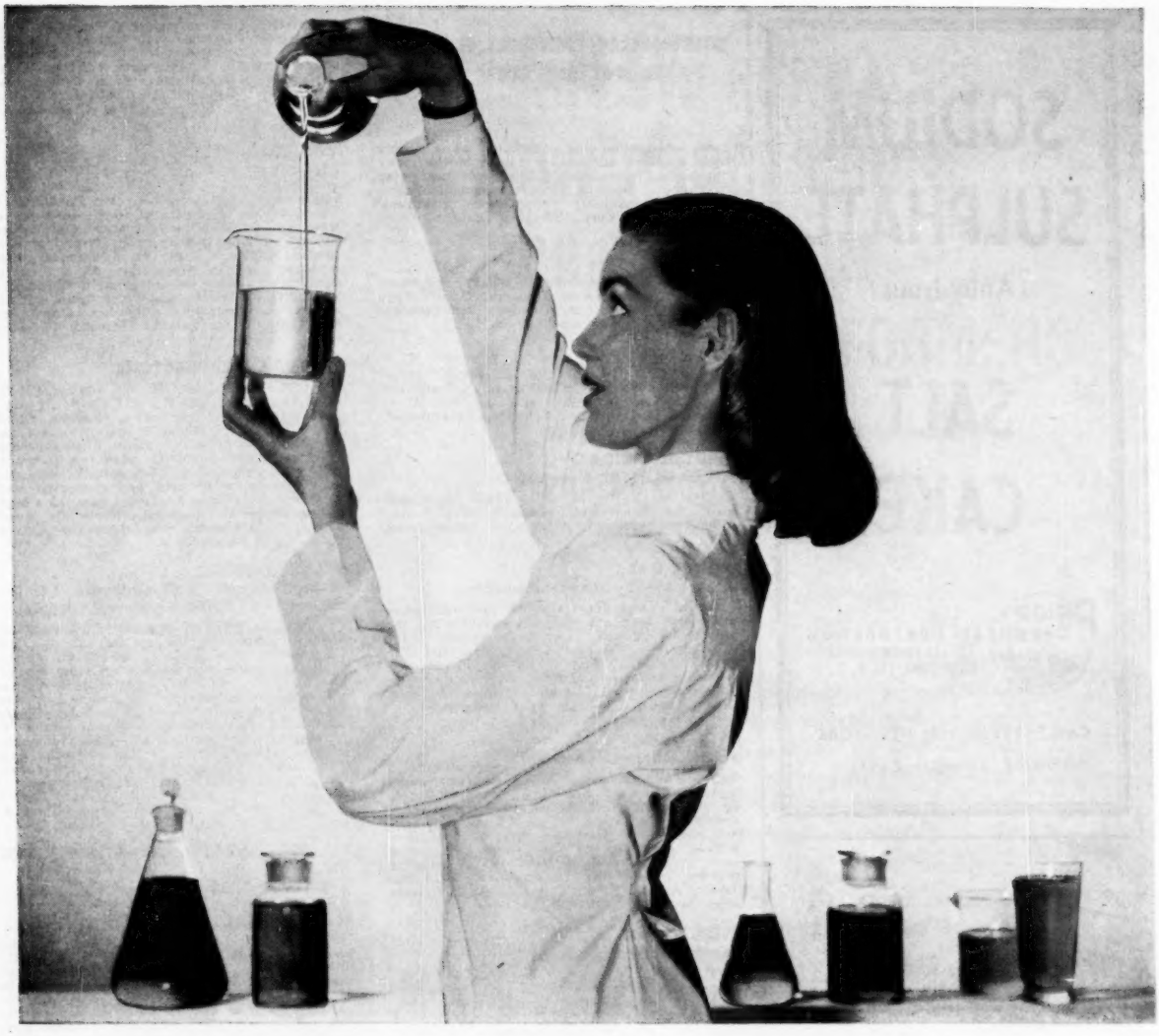
UNION CARBIDE R-64 SILICONE (silicone resin)

Constituents: 65% silicone resin in toluene. Sp. G., 1.08. Characteristics: straw-colored liquid, viscosity of 15-50 centistokes at 25 C. Solubility: soluble in toluene, xylene, hydrocarbons with KB greater than 50. Suggested uses: for cold-blending with organic resins for high-temperature aluminum paints and baking enamels. Availability: commercial quantities. Union Carbide Corp., Silicones Division.

UNION CARBIDE R-610 SILICONE VARNISH

Constituents: 65% silicone resin in xylene. Sp. G., 1.05. Characteristics: brown-colored liquid; viscosity 75-175 centipoises. Chemical properties: fast curing time, excellent flexibility,

*Registered trademark.



Pretty colors not welcome!

INDUSTRY makes many products that must be crystal-clear—without a trace of color or contaminants. A good example is the liquid sugar being poured above. Processors have found that the most efficient and economical way to remove unwanted color from most liquids is to circulate them through a bed of Pittsburgh granular activated carbon—small coal-derived particles that look like tiny, hard black sponges. They're so porous that a single pound contains *125 acres* of adsorbent surface!

These amazing granules were developed by Pittsburgh Coke & Chemical. In addition to color removal, they're widely used today for pharmaceutical purification, solvent recovery, air and water purification and dozens of other vital adsorption processes. They're another outstanding example of Pittsburgh Coke's unique ability to create better, more useful products from coal . . . and to guard their quality and purity through every step of production, from coal to finished product.

PITTSBURGH
COKE & CHEMICAL CO.
Grant Building • Pittsburgh 19, Pa.

WSW 6570

COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

SODIUM SULPHATE

(Anhydrous)

SALT CAKE

PRIOR CHEMICAL CORPORATION
420 LEXINGTON AVENUE
NEW YORK 17, N. Y.

CABLE: PRIORCHEM NEW YORK

PHONE: LExington 2-9811

Discover
INDUSTRY'S NEW
ELEMENT!

...the magic element of Colorado Climate, the element that gives Colorado Industry the advantages of greater worker productivity, fast growing new markets...and the BONUS of Pleasant Living. Before selecting your plant location, discover all the elements of success awaiting your industry in Colorado, the state that more than meets your site requirements.

COLORADO

Department of Development
60 State Capitol
Denver 2, Colorado

EXECUTIVES:
Write today for your free, revised-to-the-minute analysis...
INDUSTRIAL COLORADO

NEW CHEMICALS FOR INDUSTRY 483

quick penetration and saturation, short drying time, excellent adhesion are some of the many outstanding properties. Suggested uses: for coating and bonding electrical insulation components. Availability: commercial quantities. Union Carbide Corp., Silicones Division.

URACIL-2-C^{14}

$C_3C^{14}H_4O_2N_2$; M. W., 112; Purity: radiochemically pure (by chromatography). Suggested uses: for biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

URIDINE-2-C^{14}

$C_8C^{14}H_{12}O_6N_2$; M. W., 244.2; Purity: radiochemically pure (by chromatography). Suggested uses: for biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

URIDYLIC ACID-2-C^{14}, MIXED ISOMERS 2' and 3'

$C_8C^{14}H_{13}O_9N_2P$; M. W., 324.2. Suggested uses: for biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

UVINUL D-50
(2,2',4,4'-tetrahydroxybenzophenone.)

Chemical properties: absorbs and dissipates ultraviolet radiation without degrading in the process. Suggested uses: as a stabilizer for clear lacquers and plastic films, dyes and pigments, cosmetics, etc.; in the manufacture of protective lacquers and films. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

UVINUL DS-49
(substituted benzophenone)

Purity: approximately 67%. Characteristics: light-yellow powder. Solubility: soluble in water, methyl alcohol, ethyl alcohol; insoluble in ethyl acetate, methyl ethyl ketone. Chemical properties: absorbs and dissipates ultraviolet radiation without degrading in the process. Suggested uses: as an ultraviolet stabilizer for aqueous systems. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

UVINUL MS-40
(substituted benzophenone)

M. P., 109-123 C; Purity: approximately 90%. Characteristics: cream-tan powder. Solubility: soluble in water, methyl alcohol, ethyl alcohol, ethyl acetate, methyl ethyl ketone. Chemical properties: absorbs and dissipates ultraviolet radiation without degrading in the process. Suggested uses: as an ultraviolet stabilizer for aqueous systems. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

UVITEX A

Characteristics: fine aqueous dispersion with slightly yellow color. Solubility: dilutes readily with water. Chemical properties: a nonionic fluorescent brightening agent in paste form, for acrylic fibers; produces intense neutral white effects of very high light fastness; best applied in bath treatment at about pH 3.0, at the boil for 30 minutes; stable in chlorine bleaches and acid scours. Suggested uses: chiefly for brightening Orlon and other acrylic fibers; also effective on nylon, cotton and rayon; useful in blends; gives strong whites on blankets, piece goods, etc. Availability: commercial quantities. CIBA Co., Inc.

UVITEX T PASTE

Characteristics: fine aqueous dispersion with slightly yellowish color. Solubility: dilutes readily with water. Chemical properties: a nonionic fluorescent brightening agent in paste form, for cellulosic fibers; yields strong neutral tones of white, of good levelness and penetration even on tightly woven goods; can be applied by padding or exhaustion at 160-180 F; stable to hypochlorite and hydrosulfite bleaching. Suggested uses: primarily on cotton and rayon, but is effective also on nylon, acetate and wool; for yarn packages and piece goods. Availability: commercial quantities. CIBA Co., Inc.

VALERIC ACID

C_4H_9COOH; M. W., 102.14; Sp. G., 0.9401 at 20/20 C; B. P., 186.2 C (at 760 mm.). Characteristics: water-white color; penetrating odor. Solubility: in water, 2.4% by weight at 20 C; solubility of water in, 13.0% by weight at 20 C. Chemical properties: undergoes reactions typical of normal mono-basic organic acids. Suggested uses: as an intermediate for flavors, plasticizers, pharmaceuticals, metallic salts, vinyl stabilizers; extraction of mercaptants from hydrocarbons. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

VALERALDEHYDE

$CH_3(CH_2)_3CHO$; M. W., 86.13; Sp. G., 0.8122 at 20/20 C; B. P., 103.3 C (at 760 mm.). Characteristics: water-white color. Solubility: in water, 1.35% by weight at 20 C; solubility of water in, 1.30% by weight at 20 C. Chemical properties: undergoes reactions typical of aldehydes. Suggested uses: as a chemical intermediate; for the preparation of amines for accelerating rubber vulcanization; modified polyvinylacetal, phenolic and urea resins. Availability: semicommercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

GAMMA-VALEROLACTONE

$CH_3CHCH_2CH_2C{=}O$; M. W., 100.06; Sp. G., 1.052 at 25/25 C; M. P., —31 C; B. P., 206-7 (760 mm.). Characteristics: a colorless, mobile liquid. Solubility: soluble in water, alcohol and many common organic solvents. Chemical properties: a lactone, completely miscible with water; can be hydrogenated to 1,4-pentanediol, esterified in the presence of acid and condensed with aldehydes or ketones. Suggested uses: as a high-boiling solvent and chemical intermediate. Availability: experimental quantities. The Quaker Oats Co., Chemicals Dept.

VELSICOL EMMI
(n-ethyl mercuri-1,2,3,6-tetrahydro 3,6-methano-3,4,5,6,7,7-hexachlorophthalimide)

$C_{11}H_7Cl_6NO_2Hg$; Constituents: 97.0% technical, or 10% emulsifiable concentrate; M. W., 600 (Hg content 33%); M. P. 190-192 C; Purity, 97.0%. Characteristics: 97.0% off-white crystalline. Solubility: readily soluble at 10% concentration (room temperature) in acetone and other ketones; moderately soluble in alcohols; slightly soluble in hydrocarbons; almost insoluble in water. Chemical properties: high fungicidal activity against certain fungus growth. Suggested uses: for scab, fusarian rot and curvularia on gladiolus corms; seed treatment of small grains; fungus diseases of turf. Availability: commercial quantities. Velsicol Chemical Corp., Agricultural Chemicals Division.

VELSICOL METHYL PARATHION, 80% SOLUTION
(O,O-dimethyl O,P-nitrophenyl thiophosphate)

$C_8H_{10}NO_5PS$; Constituents, 80% methyl parathion, 3.5% related products, 16.5 aromatic petroleum distillate; Sp. G., 1.199; M. P., 65 C; Purity, 80%. Characteristics: phosphate ester insecticide, strong odor. Solubility: soluble in aromatics, alcohols and ketones; very slightly soluble in water and heptane; slightly soluble in aliphatic solvents. Chemical properties: high insecticidal activity. Suggested uses: as an insecticide-miticide. Availability: commercial quantities. Velsicol Chemical Corp., Agricultural Chemicals Division.

VELSICOL PARATHION, TECHNICAL
(O,O. diethyl o-p nitrophenyl phosphorothioate)

$C_{10}H_{14}NO_5PS$; Sp. G., 1.24-1.28 at 25 C; M. P., 6.0 C (0.6 mm.); Purity, 98.5%; B. P., 157-162 C (0.6 mm.). Characteristics: phosphate ester. Solubility: completely soluble in xylene, toluene, acetone, cyclohexanone and polymethyl naphthalenes; limited solubility in paraffinic hydrocarbons; soluble in water (20-25 ppm). Chemical properties: high insecticidal activity. Suggested uses: as an insecticide-miticide. Availability: commercial quantities. Velsicol Chemical Corp., Agricultural Chemicals Division.

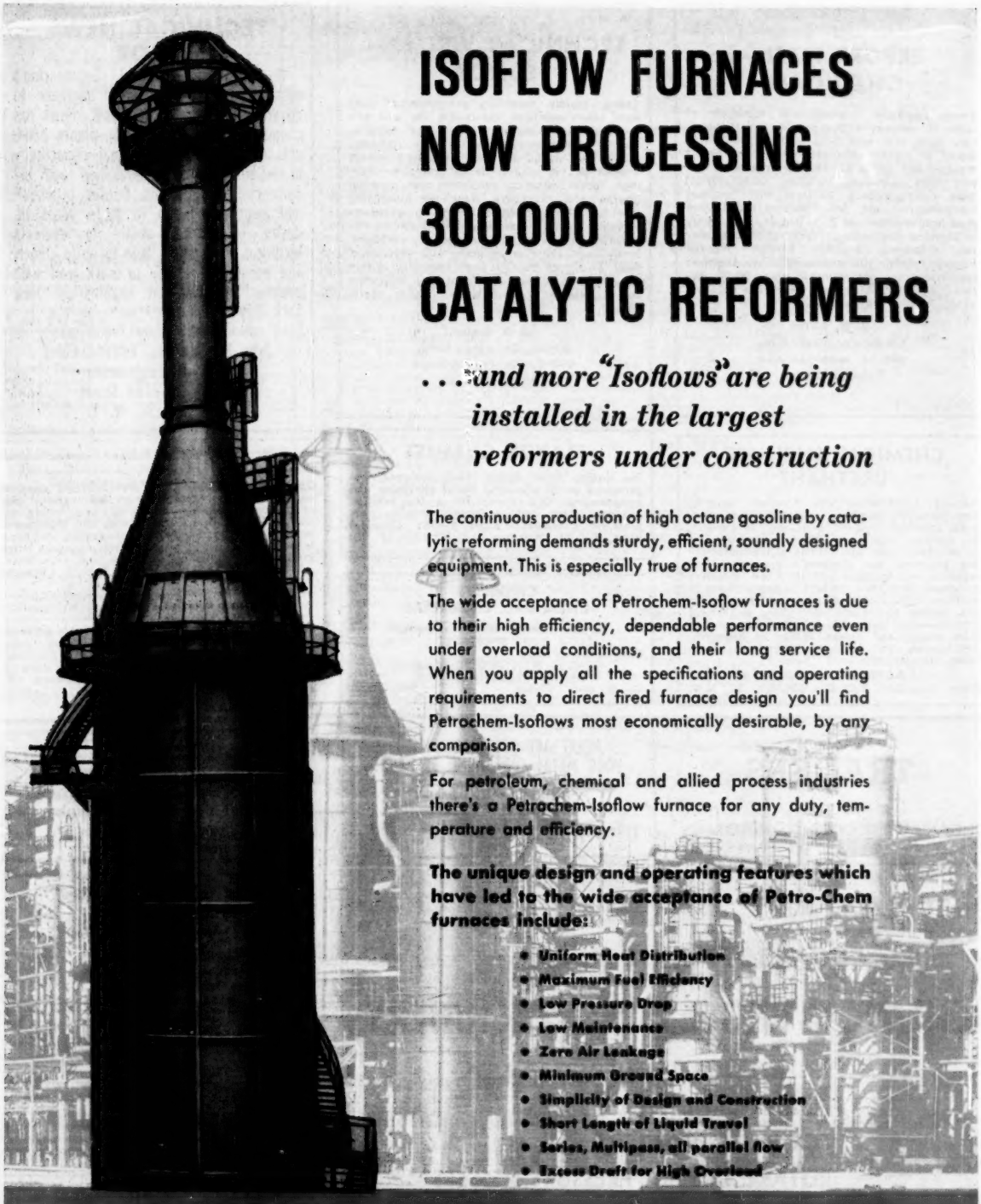
VERSALIDE® (polycyclic musk)

Constituents: a pure ketone of the polycyclic musk series, M. P., 41 C min.; Purity, by carbonyl value—208 min. Characteristics: a white crystalline powder having a powerful musk-like odor. Solubility: insoluble in water; 1.9 gms. will dissolve in 100 ml. of 70% alcohol; 7.0 gms. will dissolve in 100 ml. of 80% alcohol; readily soluble in most solvents and perfume materials. Chemical properties: a powerful and persistant musk aromatic which is exceptionally stable to light, air, heat and chemical action; stable in color and odor over a wide pH range. Suggested uses: odor and exceptional stability make the product useful wherever a musk odor can be utilized; technical bulletin GD-3 available. Availability: commercial quantities. Givaudan-Delawanna, Inc.

VERSILAD®

Constituents: a formulated, modified sodium silicate. Characteristics: an odorless, cream-

®Registered trademark.



ISOFLOW FURNACES NOW PROCESSING 300,000 b/d IN CATALYTIC REFORMERS

. . . and more "Isoflows" are being installed in the largest reformers under construction

The continuous production of high octane gasoline by catalytic reforming demands sturdy, efficient, soundly designed equipment. This is especially true of furnaces.

The wide acceptance of Petrochem-Isoflow furnaces is due to their high efficiency, dependable performance even under overload conditions, and their long service life. When you apply all the specifications and operating requirements to direct fired furnace design you'll find Petrochem-Isoflows most economically desirable, by any comparison.

For petroleum, chemical and allied process industries there's a Petrochem-Isoflow furnace for any duty, temperature and efficiency.

The unique design and operating features which have led to the wide acceptance of Petro-Chem furnaces include:

- Uniform Heat Distribution
- Maximum Fuel Efficiency
- Low Pressure Drop
- Low Maintenance
- Zero Air Leakage
- Minimum Ground Space
- Simplicity of Design and Construction
- Short Length of Liquid Travel
- Series, Multipass, all parallel flow
- Excess Draft for High Overload

PETROCHEM-ISOFLOW FURNACES

UNLIMITED IN SIZE . . . CAPACITY . . . DUTY

PETRO-CHEM DEVELOPMENT CO., INC. • 122 EAST 42nd St., New York 17, N. Y.

REPRESENTATIVES:

Bowen & Co., Houston • Wm. H. Nichols Co., Tulsa • Lester Checkolite, Los Angeles • Pavillo-Lovell, Chicago • D. D. Foster, Pittsburgh • Tarbox, Philadelphia • Phelps, Brochett & Durgin, Boston • G. M. Wallace & Co., Denver & Salt Lake City

International Montrose and Representatives: SETEL—S.A. Comercial, Industrial, y de Estudios Tecnicos, Buenos Aires, Argentina • Industrial Promotion, Caracas, Venezuela • Société Anonyme Belge, Liege, Belgium • Petrochem S.A.R.L., Puteaux, France • Stanley Nichols S.P.A., Milan, Italy • Stanley Ltd., Birmingham, England

EXPORT MAN—CHEMICALS

Young aggressive petrochemical subsidiary of major oil company with expanding export operation needs man with 5-12 years experience in export of organic chemicals. Will assist export manager and act in his absence on general export sales operations, including order service, sales correspondence, contacts with overseas representatives, etc. Some overseas travel. Man must have minimum of B. S. Degree in Chemistry or Chemical Engineering. Paint, rubber and plastics experience desirable. Foreign language fluency helpful. Heavy responsibility. Excellent opportunity for advancement. Ages: 30-40. Include age, education and experience in first letter. Replies confidential.

G. D. Ritter
Amoco Chemicals Corp.
910 So. Michigan Ave.
Chicago, Illinois

TECHNICAL WRITER—EDITOR

Young, rapidly expanding petrochemical company offers excellent opportunity for man who is skilled in converting raw technical information in interesting, readable product literature, articles for periodicals, etc. Company's current interest lies in such fields as protective coatings, rubber, plastics, detergents and chemical intermediates. Extensive plans for broadening this line. College degree including chemistry through organic essential. Proved ability to organize data, write well and fluently necessary. Salary open and commensurate with experience. Age: 23-30; up to five years technical writing experience. Give full details of age, education and experience in first letter. Replies confidential.

G. D. Ritter
Amoco Chemicals Corp.
910 S. Michigan Avenue
Chicago, Illinois

TECHNICAL NEWS EDITOR

Opening on Chemical Engineering's editorial staff for a young engineer to develop and write technical news on chemical processes, methods, plants, products and equipment. Unusual opportunity to broaden contacts, education and experience. Requirements: Degree in chemical engineering; up to three years industry experience; ability to evaluate technical information; able to write clearly and accurately; ability to work well with people; initiative and imagination. New York City location.

Send resume and salary requirements to:
John R. Callaham, Editor-in-Chief
Chemical Engineering
330 West 42nd Street
New York 36, N. Y.

CHEMICAL ENGINEER URETHANE

National organization with excellent benefits, hospitalization, insurance, retirement fund, etc., needs chemical engineer, preferably, or chemist, to manage and direct the development of polyurethane foam applications and manufacturing processes for company's products. Must supervise well-equipped laboratory and laboratory personnel. Experience required in polyurethane in addition to knowledge of latex, vinyl foam, plastics, rubber technology. Must have mechanical comprehension to be able to initiate proper machine design and proven ability of initiative, creativeness, and technical supervision. State salary requirements. Send resume to

P-6713 Chemical Week
Class. Adv. Div., P.O. Box 12, N.Y. 36, N.Y.

FLAVOR CHEMIST

For leading flavor house. Ph.D preferred, experienced in all phases of flavor chemistry and compounding. Opportunity for a top position and top salary. Position requires location near plant in Cincinnati. Reply P-6787 Chemical Week, 520 N. Michigan Ave., Chicago 11, Ill.

CHEMISTS CHEMICAL ENGINEERS

An Active, confidential service! Interview at your convenience.

Call, write or wire
GLADYS HUNTING (Consultant)
DRAKE PERSONNEL, INC.
220 S. State, Chicago • HA 7-9600

Position Vacant

Opening for research and development chemist experienced in the manufacture and various uses of protective coatings, wax, wax compounds, resins, polymer dispersions, plastic, and bituminous materials in industrial manufacturing company laboratory located in Middle West. Apply by letter giving full details of education and experience. All replies will be confidential. P-5213, Chemical Week.

Position Wanted

Chemical Sales Executive. Sales Manager presently employed by national organization seeks change. Age 31; college graduate, Chemical degree, family. Extensive nation wide sales & marketing experience petrochemicals, waxes, oils. Salary requirements $15,000. PW-6692, Chemical Week.

TRACERS

TO THE
CHEMICAL PROCESSING INDUSTRIES

WHAT ARE YOU DOING WITH YOUR METAL CONTAINING RESIDUES?

Spent Catalysts, sludges etc.
HIGHEST PRICES PAID
JOSEPH TYSON
6812 Verbena St., Phila. 26, Pa.
Livingston 8-6762—8-8514

SURPLUS BOUGHT

ODD LOTS—DISCONTINUED RAW MATERIALS
—SPENT OR CONTAMINATED SOLVENTS
RESIDUES—METAL SLUDGES—
OBSOLETE PLANT INVENTORIES

Industrial By-Products & Surplus Co.
DIV. OF ACETO CHEMICAL CO., INC.
40-40C Lawrence St., Flushing 54, N. Y.
INdependence 1-4100

FOR SALE AT

ROCK BOTTOM PRICES . . .

CHEMICAL PROCESSING MACHINERY

13 FRENCH OIL MILL EXPELLERS
FLAKERS AND FILTERS
FLASH EVAPORATORS
ROTARY DRYERS, PRESSURE VESSELS
EXTRACTORS, PUMPS
HAMMER MILLS, HEAT EXCHANGERS

WIRE—WRITE—PHONE . . .

INDUSTRIAL PLANTS CORPORATION

90 WEST BROADWAY, NEW YORK 7, N. Y.

#66-12 ROSS HIGH SPEED
PULVERIZER-CRUSHER
(2)5HP Motors mounted on Dust Proof
Metal Cabinet—"Equal to New" $500.00
Seaboard Steel Co. Inc.
New Haven, Conn.

Replies (Box No.) Address to office nearest you
c/o This publication Classified Adv. Div.
NEW YORK: P. O. Box 12 (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

For Sale

AT&M 48" dia. Suspended Centrifugal, Stainless Steel contact parts; perforated basket; vapor tight; rebuilt. Perry Equipment Corporation, 1415 North 6th St., Philadelphia 22, Pa.

Rotary Vacuum Dryer, 42" dia. x 15' long; ASME 50# jacket. Perry, 1415 N. 6th St., Phila., Pa.

3000 gallon Stainless Steel Vacuum Tank with Internal Coils. Perry Equipment Corporation, 1415 North 6th St., Philadelphia 22, Pa.

100'—9" S. S. Screw Conveyor used—excellent —complete units any length. T. N. 67 Van Reipen Ave., Jersey City.

Special Service

Private Formula Work-Will Mix Alkalies, Soaps, Detergents to your specification. From our own or your materials. One drum or carloads. R. R. Siding-Storage Facilities-Drop Shipments. All formulas held in strictest confidence. S. & S. Soap Co., 815 E. 135th St., New York 54, N. Y.

SURPLUS CHEMICALS WANTED

Chemicals—By-Products—Plasticers

Pigments—Resins—Solvents

CHEMSOL, INC.

70 Dod Street, Elizabeth N.J. EL 4-7654

NDI COORDINATED RESEARCH NEW DRUG INSTITUTE

TOXICITY TESTS following FDA procedures, for chemicals, foods, drugs, cosmetics, pesticides, additives. Biological assays. Screening tests. Complete research and development services. No obligation for estimates. Call or write Arthur D. Herrick, Director.

NEW DRUG INSTITUTE

130 East 59 St., New York 22 • Mu 8-0640

MANAGEMENT SERVICES

- General Consulting
- Management
- Patents
- Systems Engineering
- Instrumentation
- Equipment Design
- Catalyst Development
- Translation
- Chemical & Bacteriological Analysis

CHEMASTER LABORATORIES

CHEMICAL ANALYSES

Complete—$75 per sample

Essential oils, drugs, fats, ag chemicals, paints, oils, pesticides, petrochemicals, protective coatings, textile chemicals, waxes, specialties, water, cosmetics, etc.

Send credit references with samples

Box 37, Steinway Station, Long Island City 3, N.Y.

YEllowstone 2-0203

The Heyward-Robinson Company

ENGINEERS * CONSULTANTS * CONSTRUCTORS

*Chemical

*Metallurgical

*Industrial Buildings

114 LIBERTY STREET, NEW YORK 6, N.Y.

THE C. W. NOFSINGER CO.

"In Engineering, It's the PEOPLE that Count"

Engineers and Contractors for the Petroleum and Chemical Industries

307 East 63rd Street
Kansas City 13, Missouri
Phone BAltimore 1-4146

JAMES P. O'DONNELL

Consulting Engineer

Professional Engineering for the Petroleum and Process Industries

39 Broadway
New York 6, N. Y.
Beaumont, Texas

SIRRINE

ENGINEERS

Plant design & Surveys covering Chemical Electrochemical and Metallurgical Production; Industrial Waste Disposal; Water Supply & Treatment Analysis & Reports

J. E. SIRRINE CO.

Greenville South Carolina

ROGER WILLIAMS

Technical & Economic Services, Inc.

- Chemical Economics
- Chemical Market Research
- Product Evaluation

New York Office: 148 East 38th St., NYC 16
Main Office: PO Box 426, Princeton, N. J.
Princeton 1-0209
MUrray Hill 5-5257

Laboratory Services

for the Food, Feed Drug and Chemical Industries

Analyses, Biological Evaluating, Toxicity Studies
Insectide Testing and Screening
Flavor Evaluation
Project Research and Consultation
Write for price schedule

Wisconsin Alumni Research Foundation
P. O. Box 2217 Madison 1, Wisconsin

NEW CHEMICALS FOR INDUSTRY

colored aqueous slurry. Suggested uses: as a corrugated boxboard adhesive. Availability: commercial quantities. Diamond Alkali Co., Silicate-Detergent-Calcium Division.

VERSILATE*

Constituents: a formulated sodium silicate less modified than Versilad. Characteristics: an odorless, colorless aqueous solution. Solubility: soluble in all proportions in water. Suggested uses: as a raw material for compounding Versilad, also a corrugated boxboard adhesive itself. Availability: commercial quantitites. Diamond Alkali Co., Silicate-Detergent-Calcium Division.

VFP-56

Constituents: combination of NH_3 and P_2O_5 reaction products. Characteristics: clear, water white, viscous liquid. Chemical properties: semi-permanent flameproofing compound; may resist several launderings or water rinses; increases wet strength of paper. Suggested uses: for flameproofing of textiles and paper. Availability: semicommercial quantities. Victor Chemical Works, Special Products Division.

VINYL ALLYL ETHER

CH_2:$CHOCH_2CH$:CH_2; M. W., 84.12; Sp. G., 0.805 at 20/20 C; B. P., 67.4 C (at 760 mm.). Solubility: in water, 0.3% by weight. Chemical properties: can be polymerized in bulk or solvent systems with ionic catalysts to give polymers with residual unsaturation. Suggested uses: in the preparation of polymers with residual functionality; as a chemical intermediate. Availability: experimental quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

VINYLPYRROLIDONE/VINYL ACETATE COPOLYMER E-335, E-535, and E-735.

Constituents: varying amounts of vinylacetate and vinylpyrrolidone supplied as 50% solutions in ethanol. Characteristics: clear liquid. Solubility: soluble in water and alcohols. Chemical properties: water-soluble film former. Suggested uses: in cosmetics (hair sprays), pharmaceutical products (tablet coatings, spray bandages), protective coatings, spray-on gloves. Availability: commercial quantities. General Aniline & Film Corp., Antara Chemicals Sales Division.

VIRCO-PET 20

Sp. G., 0.96-1.00. Characteristics: tan, viscous liquid. Solubility: soluble in acetone, ethanol, carbon tetrachloride, benzene, kerosene, gasolene, ethylene glycol. Chemical properties: inhibits corrosion of steel and other metals when used at low concentrations. Suggested uses: as a corrosion inhibitor in lube oils, gasoline, antifreeze solutions, protective coatings, liquid cleaners, etc. Availability: commercial quantities. Virginia-Carolina Chemical Corp., Chemicals Division.

VISCOSITY INDEX IMPROVER D

Chemical properties: a polymeric viscosity index improver with outstanding shear stability properties. Suggested uses: recommended for compounding multigraded lubricants and automatic transmission fluids. Availability: commercial quantities. Union Carbide Corp., Union Carbide Chemicals Co. Division.

VYGEN 105 (polyvinyl chloride resin)

Sp. G., 1.40; Purity, 100%. Characteristics: white odorless powder. Solubility: slightly soluble in MEK. Suggested uses: for calendering, molding, extrusion operations either dry blend or from pelletized compound. Availability: commercial quantities. General Tire & Rubber Co., Chemical Division.

VYGEN 120 (polyvinyl chloride resin)

Sp. G., 1.40; Purity, 100%. Characteristics: white odorless powder. Solubility: slightly soluble in mek. Suggested uses: in calendering, molding, extrusion operations either dry blend or from pelletized compound; approved for electrical applications. Availability: commercial quantities. General Tire & Rubber Co., Chemical Division.

VYGEN 161 (polyvinyl chloride resin)

Sp. G., 1.40; Purity, 100%. Characteristics: white odorless powder. Solubility: slightly soluble in mek. Suggested uses: in calendering, molding, extrusion operations either dry blend or from pelletized compound. Availability: commercial quantities. General Tire & Rubber Co.; Chemical Division.

VYGEN 6812 COMPOUND (polyvinyl chloride compound)

Sp. G., 1.32; Purity, 100%. Characteristics: black, white or neutral powder; odorless. Solubility: slightly soluble in MEK. Suggested uses: in extrusion operations; approved for electrical applications. Availability: commercial quantities, General Tire & Rubber Co., Chemical Division.

225 WAX (fatty amide wax)

Characteristics: tan color; finely beaded form. Solubility: soluble in hot naphtha, toluene, and most organic solvents; insoluble in water and alcohol. Availability: commercial quantities. Carlisle Chemicals Works, Inc.

W-617 RESIN EMULSION (hydrocarbon resin emulsion)

Constituents: anionic emulsion of hydrocarbon copolymer resin. Solids content: 49-51%; pH: 8.5-9.5; wt./gal @77%, 8.3-8.4 lbs.; Average particle size: 1 micron; Viscosity: 60-75 krebs units. Compatibility: compatible with styrene-butadiene and acrylic latexes. Chemical properties: film former of high water and alkali resistance; makes possible paint films with high scrubbability at low vehicle cost. Suggested uses: uses: for interior wall paint; primer-sealer vehicles; as a latex extender in paper coatings, adhesives, rubber compounding. Availability: semicommercial quantities. Velsicol Chemical Corp., Industrial Division.

WB-5 WAX

Constituents: a chemically modified high-melting microcrystalline wax; acid no. 19-27; saponification no. 50-65; penetration 100/5 @ 77 F, 1-3; M. P., 185 F min. Chemical properties: excellent oil retention properties, excellent for dispersing pigments. Suggested uses: for carbon paper inks. Availability: commercial quantities. Petrolite Corp., Bareco Wax Co. Division.

WING STAY T

Constituents: hindered phenol. Density: 0.9 g./ml. Characteristics: light-tan liquid. Chemical properties: high-potency, nonstaining, nondiscoloring antioxidant. Suggested uses: as a raw polymer stabilizer for synthetic polymers; an excellent antioxidant for use in compounded stock where nonstaining and nondiscoring properties are desired. Availability: commercial quantities. The Goodyear Tire & Rubber Co., Chemical Division.

XANTHOSINE (9-1-ribofuranosylxanthine)

$C_{10}H_{12}O_6N_4$; M. W., 284.2; decomposes on heating. Characteristics: white, crystalline powder. Solubility: sparingly soluble in cold water, easily soluble in hot water; soluble in hot dilute alcohol; practically insoluble in organic solvents; mineral acid splits xanthosine into xanthine and D-ribose. Suggested uses: for biochemical research. Availability: commercial quantities. Schwarz Laboratories, Inc.

META-XYLENE

C_8H_{10}; M. W., 106.16; Sp. G., 0.86431 at 20/4 C; M. P.—47.87 C; Purity, pure grade —99 mol % minimum, technical grade—95 mol % minimum; B. P., 137.9 C. Suggested uses: in organic syntheses. Availability: experimental quantities. Phillips Petroleum, Special Products Division.

ZYTEL* 37X NYLON RESIN

Composition: jet black molding and extrusion powder; stabilized against degradation by heat and by ultraviolet light; excellent processing characteristics. Suggested uses: primarily a wire jacketing material; combines excellent mechanical characteristics with outstanding resistance to thermal degradation and effects of weathering; for use as jackets for power and communication cables, for wire rope, tree wire, and other applications where abrasion, outdoor exposure, or elevated temperatures are encountered. Availability: semicommercial quantities. E. I. du Pont de Nemours & Co., Plastics Sales Division, Polychemicals Dept.

ZYTEL* 42 NYLON RESIN

Description: a cube-cut nylon extrusion powder with exceptional form-stability in molten stage and toughness and stiffness in finished product. Physical properties: form-stability at high temperatures; toughness over a wide range of temperatures; abrasion resistant; strong in thin sections; good bearing characteristic; light in weight; chemical- and solvent-resistant. Suggested uses: tubing for automotive and other applications; aerosol bottles; extrusions for washers, grommets, and bearings; may be laminated to paper, foil, and other films. Availability: commercial quantities. E. I. du Pont de Nemours & Co., Inc., Plastics Sales Division, Polychemicals Dept.

*Registered trademark.

CHEMICAL WEEK • ADVERTISERS INDEX

December 14, 1957

ACE GLASS INC. 48
Agency—Ray Hawley Adv.

AMERICAN MINERAL SPIRITS CO. 27
Agency—Leo Burnett Co.

ANTARA CHEMICALS, DIV. OF GENERAL ANILINE & FILM CORP. ... 74
Agency—The House of J. Hayden Twiss

ARMOUR LABORATORIES, THE 72
Agency—Jordan-Sieber & Corbett, Inc.

ATLAS POWDER CO. 17
Agency—Aitken Kynett Co.

BAKER & ADAMSON DIV. ALLIED CHEMICAL & DYE CORP. ..... 3rd Cover
Agency—Atherton & Currier, Inc.

BARECO WAX CO., DIV. OF PETROLITE CORP. 70
Agency—Batz-Hodgson-Neuwoehner, Adv.

BECCO CHEMICAL DIV., FOOD MACHINERY & CHEMICAL CORP. 97
Agency—John Mather Lupton, Inc.

BERKSHIRE CHEMICALS, INC. DIV. OF VITRO CORP. OF AMERICA 50
Agency—Molesworth Assoc.

BUFFALO FORGE CO. 20
Agency—Melvin F. Hall Adv., Inc.

CELANESE CORP. OF AMERICA 2, 93
Agency—Ellington & Co., Inc.

CHEMICAL SOLVENTS INC., THE C. P. .. 70

CHEMSTRAND CORP., THE 77
Agency—Robert Luckie & Co.

COLORADO DEPT. OF DEVELOPMENT .. 120
Agency—William Kastka & Assoc., Inc.

CONCORD CHEMICAL CO. 98
Agency—John B. Ferguson Jr. Adv.

DELHI TAYLOR OIL CORP. 11
Agency—Sam J. Gallay Adv.

DIAMOND ALKALI CO. 76
Agency—Fuller & Smith & Ross, Inc.

DICALITE DEPT., GREAT LAKES CARBON CORP. 99
Agency—Darwin H. Clark Co.

DU PONT de NEMOURS & CO., INC., E. I. ELECTROCHEMICALS DEPT., CHLORINE PRODUCTS DIV. 7
Agency—Batten, Barton, Durstine & Osborn, Inc.

EASTERN STATES CHEMICAL CORP. 36
Agency—Erwin Wasey-Ruthrauff & Ryan, Inc.

EL DORADO DIV., FOREMOST FOOD & CHEMICAL CORP. 89
Agency—Sidney Garfield & Assoc.

EMERY INDUSTRIES, INC. 28
Agency—Erwin Wasey-Ruthrauff & Ryan, Inc.

EMULSOL CHEMICAL CORP. DIV. OF WITCO CHEMICAL CO. ..... 4th Cover
Agency—Hazard Adv. Co.

ENJAY CO. 89
Agency—McCann-Erickson, Inc.

ESCAMBIA CHEMICAL CORP. 25
Agency—Godwin Adv. Agency

ETHYL CORP. 35
Agency—H. B. Humphrey Alley & Richards Inc.

FRITZSCHE BROTHERS, INC. 98
Agency—Calson Adv. Corp.

GENERAL AMERICAN TRANSPORTATION CORP. AIRSLIDE CARS DIV. 10
Agency—Edward H. Weiss & Co.

GENERAL ELECTRIC CO. 4-5
Agency—G. M. Basford Co.

GENERAL MILLS, INC. 14
Agency—Knox Reeves Adv., Inc.

GREEFF & CO., R. W. 98
Agency—The House of J. Hayden Twiss

GRINNELL CO., INC. 19
Agency—Noyes & Co.

HALL CO., THE C. P. 86
Agency—Cruttenden Adv.

HARCHEM DIV., WALLACE & TIERNAN, INC. 82
Agency—Branstater Assoc. Inc.

HARSHAW CHEMICAL CO., THE 67

HERCULES POWDER CO. 42
Agency—Fuller & Smith & Ross, Inc.

INTERNATIONAL MINERALS & CHEMICAL CORP. 53
Agency—C. Franklin Brown Adv., Inc.

JEFFERSON LAKE SULPHUR CO. 88
Agency—Bauerlein Adv., Inc.

JOHNS-MANVILLE CORP. 22-23
Agency—J. Walter Thompson Co.

JONES & LAUGHLIN STEEL CORP. 15
Agency—Ketchum, MacLeod & Grove, Inc.

KAY-FRIES CHEMICALS, INC. 60
Agency—Richard Lewis Adv.

KOPPERS CO., INC. CHEMICAL DIV. 83
Agency—Batten, Barton, Durstine & Osborn, Inc.

LINDE CO., DIV. OF UNION CARBIDE CORP. 49
Agency—J. M. Mathes, Inc.

LINDSAY CHEMICAL CO. 26
Agency—C. Franklin Brown, Inc.

MERCHANTS CHEMICAL CO., INC. 84
Agency—G. M. Basford Co.

METAL HYDRIDES, INC. 16
Agency—Creamer-Trowbridge Co.

MONSANTO CHEMICAL CO. 31
Agency—Gardner Adv. Co.

NATIONAL CARBON CO. DIV. OF UNION CARBIDE CORP. 61
Agency—William Esty Co.

NATIONAL ENGINEERING CO. 45
Agency—Russell T. Gray, Inc.

NATIONAL LEAD CO., THE 41
Agency—Marschalk & Pratt Co., Inc.

NOPCO CHEMICAL CO. 13
Agency—Lewin, Williams & Saylor, Inc.

NORFOLK & WESTERN RAILWAY 29
Agency—Houck & Co., Inc.

OLIN MATHIESON CHEMICAL CO. 2nd Cover
Agency—Doyle, Kitchen & McCormick, Inc.

ORONITE CHEMICAL CO. 54
Agency—L. C. Cole Co.

OWENS ILLINOIS GLASS CO. 62-63
Agency—J. Walter Thompson

PENNSALT CHEMICALS CORP. 80
Agency—Aitkin-Kynett Co. Adv.

PERMUTIT CO. 36
Agency—Cunningham & Walsh, Inc.

PETRO-CHEM DEVELOPMENT CO., INC. 121
Agency—Sam J. Gallay Co., Adv.

PFAUDLER CO., THE 8-9
Agency—The Rumrill Co.

PFIZER & CO., CHARLES 57
Agency—MacManus, John & Adams, Inc.

PITTSBURGH COKE & CHEMICAL CO. .. 119
Agency—W. S. Walker Advertising, Inc.

POWELL CO., THE WILLIAM 12
Agency—The Ralph H. Jones Co.

PRIOR CHEMICAL CORP. 120
Agency—Robertson Martin Adv.

PROCON, INC. 6
Agency—Don Colvin Co., Inc.

RICHARDSON SCALE CO. 66
Agency—O. S. Tyson & Co., Inc.

ROCKWELL MFG. CO. 78
Agency—Marsteller, Rickard, Gebhardt & Reed Inc.

ROHM & HAAS CO. 51
Agency—Arndt, Preston, Chapin, Lamb & Keen, Inc.

RUBBER CORP. OF AMERICA 78
Agency—Ovesey & Straus, Inc.

SHAWINIGAN RESINS CORP. 68
Agency—Wilson, Haight, Welch & Grover, Inc.

SILICONES DIV. UNION CARBIDE CORP. 90
Agency—J. M. Mathes, Inc.

SINCLAIR CHEMICALS, INC. 71
Agency—Morey, Humm & Warwick

SINDAR CORP. 72
Agency—Hazard Adv. Co.

SOHIO CHEMICAL CO. 46
Agency—Klau-Van Pietersom-Dunlap Inc.

SONNEBORN SONS, INC. L. 87
Agency—St. Georges & Keyes, Inc.

SUN OIL CO. 73
Agency—Erwin Wasey-Ruthrauff & Ryan, Inc.

TENNESSEE CORP. 86
Agency—Crawford & Porter, Inc.

TITANIUM METALS CORP. OF AMERICA 1
Agency—W. L. Towne Adv.

TRUBEK LABORATORIES, INC. 32
Agency—Ray Ellis Adv.

UNION BAG-CAMP PAPER CORP. 24
Agency—Smith, Hagel & Knudsen, Inc.

UNION CARBIDE CHEMICALS CO. DIV. OF UNION CARBIDE CORP. 21, 66
Agency—J. M. Mathes, Inc.

U.S. STEEL PRODUCTS DIV. U.S. STEEL CORP. 79
Agency—Batten, Barton, Durstine & Osborn Inc.

VITRO CORP. OF AMERICA 58
Agency—Molesworth Assoc.

WEST PENN POWER CO. 30
Agency—Fuller & Smith & Ross, Inc.

WYANDOTTE CHEMICAL CORP. 18
Agency—Brooke, Smith, French & Dorrance Inc.

tracers SECTION

(Classified Advertising)

F. J. Eberle, Business Mgr.

CHEMICALS: Offered/Wanted 122

EMPLOYMENT 122

EQUIPMENT: Used/Surplus New For Sale 122, 123

WANTED 122

MANAGEMENT SERVICES 123

SPECIAL SERVICES 122

ADVERTISING STAFF

Atlanta 3 ..... Robert H. Powell
1301 Rhodes-Haverty Bldg., JAckson 3-6951

Boston 16 .... 350 Park Square Building, Paul F. McPherson, HUbbard 2-7160

Chicago 11 ..... Alfred D. Becker, Jr. R. J. Claussen, 520 N. Michigan Ave., MOhawk 4-5800

Cleveland 15 ..... Vaughn K. Dissette 1510 Hanna Bldg., SUperior 1-7000

Dallas 1 ..... George Miller, The Vaughn Bldg., 1712 Commerce St., RIverside 7-5117

Denver 2 ..... J. Patten 1740 Broadway, ALpine 5-2981

Detroit 26 ..... 856 Penobscot Bldg., H. J. Sweger, Jr., WOodward 2-1793

London H. Lagler, McGraw-Hill House, 95 Farrington St., E.C. 4 England

Los Angeles 17 .... John B. Uphoff, 1125 West Sixth St., MAdison 6-9351

New York 36 ..... Knox Armstrong, B. A. Johnson, P. F. McPherson, Charles F. Onasch, L. Charles Todaro, 500 5th Ave., OXford 5-5959

Philadelphia 3 William B. Hannum, Jr. Architects Bldg., 17th & Sansom Sts., RIttenhouse 6-0670

Pittsburgh 22 .. V. K. Dissette, Room 1111 Henry W. Oliver Bldg., ATlantic 1-4707

San Francisco 4 ..... William C. Woolston, 68 Post St., DOuglas 2-4600

St. Louis 8 ..... 3615 Olive St., Continental Bldg., R. J. Claussen, JEfferson 5-4867

There's an important difference in

B&A® Purified AMMONIUM SULFATE

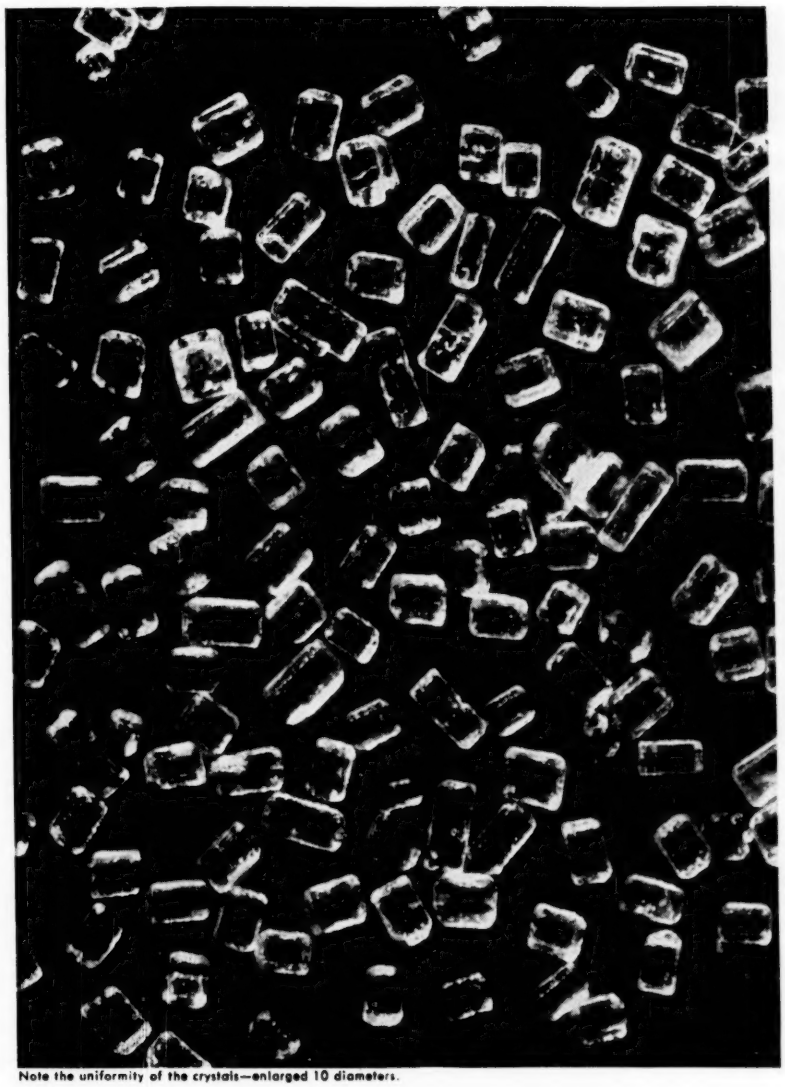
Here's what it means to you –

Ordinary commercial Ammonium Sulfate is a by-product material. B&A *Purified* Ammonium Sulfate is not. It is produced by B&A from carefully selected raw materials . . . manufactured to rigid specifications.

Compare our typical analysis below with the Ammonium Sulfate you are now using. You'll see that B&A Purified Ammonium Sulfate is extremely low in iron, lead and arsenic, thus providing superior quality for high purity end products. Also, its crystals are highly uniform in size, and it flows freely.

This extra "B&A Quality" can be worth much more to you than the difference in cost over ordinary by-product Ammonium Sulfate. For example—due to its low iron content, B&A Purified Ammonium Sulfate results in added luster and more even dyeing of wool and nylon . . . also gives greater dye exhaustion than ordinary commercial grades.

To make the best, you have to *use* the best. Specify B&A Purified Ammonium Sulfate.



Note the uniformity of the crystals—enlarged 10 diameters.

B&A AMMONIUM SULFATE, PURIFIED

Typical Analysis:

Assay $(NH_4)_2SO_4$	99.5	%
Insoluble	0.005	%
Residue after Ignition	0.01	%
Chloride (Cl)	0.001	%
Phosphate (PO_4)	0.001	%
Arsenic (As)	less than 0.00005	%
Heavy Metals (as Pb)	0.0002	%
Iron (Fe)	0.0005	%

Setting the Pace in Chemical Purity since 1882

BAKER & ADAMSON®
Fine Chemicals

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte • Chicago • Cleveland (Miss.) • Cleveland (Ohio) • Denver Detroit • Houston • Jacksonville • Kalamazoo • Los Angeles • Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Providence • San Francisco Seattle • St. Louis • Yakima (Wash.) **In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver**

NOW! LOW COST HIGH QUALITY EMULSIFIERS

FIELD-TESTED FOR *insecticide* FORMULATIONS

NEW!
EMCOLS
H-900
H-902

This important new advance in emulsifiers will definitely lower your insecticide costs by a substantial margin.

All the knowledge of the Emulsol laboratory has been used in developing Emcols H-900 / H-902. You can depend upon the same rigid quality control, the same uniformity in performance . . . the same superb technical service.

These economies are the direct result of new plant equipment and improved procedures.

Yes, it will pay you to look into Emcols H-900 / H-902. This emulsifier pair is effective separately or in combination for such insecticides as Aldrin, BHC, Chlordane, DDT, Dieldrin, Endrin, Heptachlor, Lindane, Parathion, Methyl Parathion, Toxaphene and others.

Check your Emulsol Technical Representative or write for full details including pesticide formulations using Emcols H-900 / H-902.

Serving Agriculture and Industry with dozens of EMCOL emulsifying agents.

Emulsol

DEPT. CW-12

EMULSOL CHEMICAL CORPORATION

division of Witco Chemical Company

75 East Wacker Drive • Chicago 1, Illinois